AVIATION

SEPTEMBER 10, 1923 Issued Weekly PRICE 10 CENTS

U. S. Naval Airship ZR1 Ready for her Maiden Flight, Sept. 4, 1923, Lakehurst, N. J.
Photo International

VOLUME XV

NUMBER 11

SPECIAL FEATURES

SUCCESSFUL TRIALS OF AIRSHIP ZR1

ILLUMINATING AIRWAYS FOR NIGHT FLYING

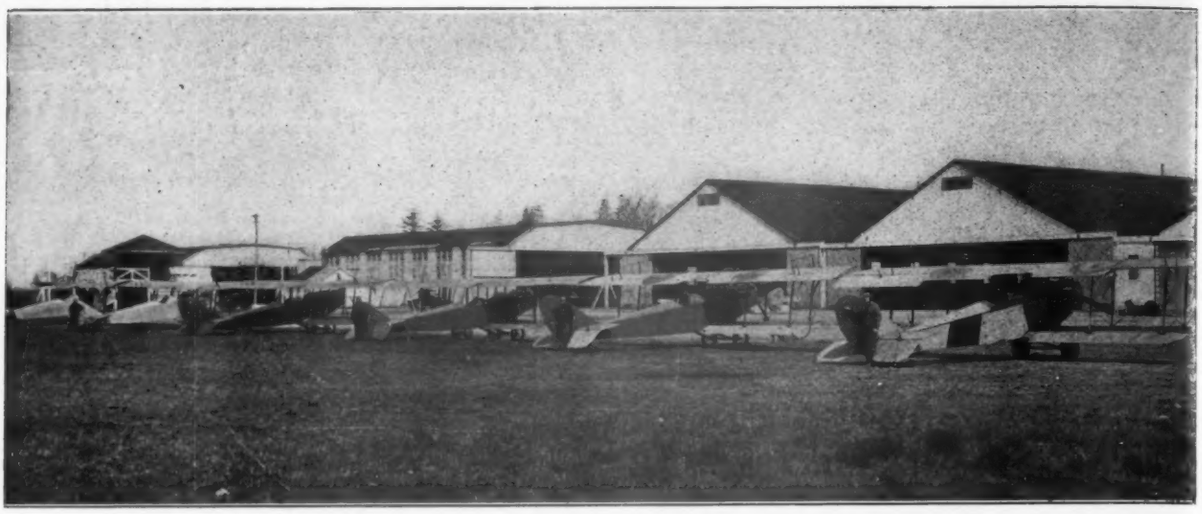
PROGRESS OF CONSTRUCTION WORK AT ST. LOUIS

HOW BANKS CAN BENEFIT BY AERIAL TRANSPORTATION

THE GARDNER, MOFFAT CO., INC.
HIGHLAND, N. Y.
225 FOURTH AVENUE, NEW YORK

Entered as Second-Class Matter, Nov. 22, 1920, at the Post Office at Highland, N. Y. under Act of March 3, 1879.

Curtiss



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SEPTEMBER 10, 1923

AVIATION

VOL. XV. NO. 11

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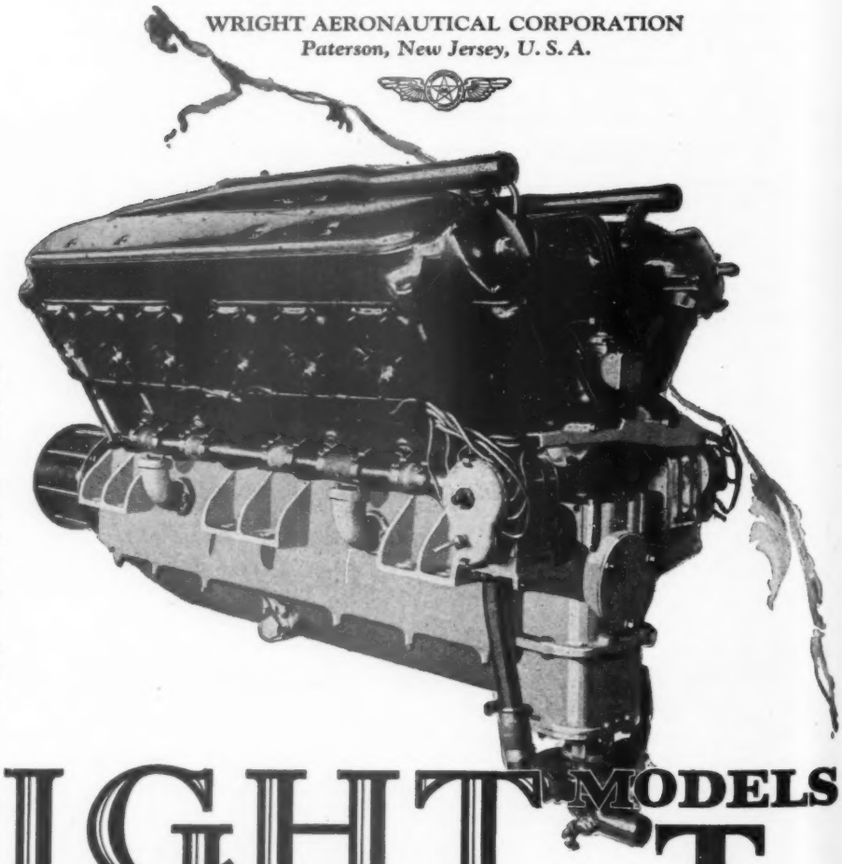

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Vol. XV SEPTEMBER 10, 1923 No. 11

Trial Flight of the Airship ZR1

THE successful launching of the United States naval airship ZR1 at Lakehurst, N. J., is an event of the first magnitude in the history of our lighter-than-air development work, one of which the Navy may take justifiable pride. As the first airship of the rigid type built in this country—and built to American design specifications, of American materials, including its Packard engines—the ZR1 represents a truly stupendous effort on the part of all those who have been concerned with the design and construction of this ship.

The design and construction of the ZR1, under the shadow of the disasters of R38 and Roma, required indeed the greatest courage and stability to carry through. The final designs were not undertaken until over four years had been spent in an intensive study of the problem. The manufacture of a new alloy of aluminum, duralumin, in the United States had to be accomplished successfully; the manufacture of goldbeaters' skin fabric; the development of a true airship engine of phenomenal endurance and economy (compared with airplane standards of the day); the development of light reduction and reverse gears for high power; the development of a theory of structural design; the testing of this theory by experiment on models and full-size girders; the construction of a great hangar of unusual proportions, and the disclosure by scientific analysis of the fundamental secrets of the Germans who developed their rigids after sixteen years work and unlimited funds.

The submission of the design to the foremost structural engineers in the country was in no way due to any question as to the correctness of the design. This was merely one of the steps in the development of the program where an outside check was wanted. The results were most gratifying as the committee gave a 100 per cent O.K. as to structural strength.

Every step in the erection of the ZR1 was checked wherever possible, the first gas cell installed in the ship was filled with helium to maximum operating pressure and careful measurements were taken of the strain in the members of the adjacent hull structure. Before the ship actually took the air, it was subjected to a methodical program of tests, including power plant tests of each car, with ship inclined, sand load tests of control system and control surfaces, safety valve tests, etc.

Inasmuch as the question has been asked in some quarters why the aircraft industry was not represented on the committee which investigated the design of the ZR1, the following may be said. What was wanted was experts with brains who could attack from a fresh point of view the most baffling problem in indeterminate structures ever presented—and the Navy believes that the men selected by the National Advisory Committee for Aeronautics had the highest qualifications for this kind of work.

As to the point of cost, which has also been raised in connection with the building of the ZR1, it should be remarked that cost is quite secondary where so many lives are involved and the aeronautic arts of our country are raised in so ambitious a scale. The work done for and on ZR1 has already had by-products of great value to aircraft construction in general, the principal ones being:—Availability of duralumin sheet, strip, sections and stampings to everyone at low cost and of a quality superior to that produced in Germany, France or England; an object lesson in metal fabrication for all airplane constructors who have visited the Naval Aircraft Factory and Lakehurst, which are always open to them; and special machinery, jigs, and tools devised for fabricating duralumin for ZR1 are already being copied extensively.

It will be seen from the above that all that human ingenuity could devise to insure the safety of the ZR1 was taken advantage of and incorporated in this, our first nationally built rigid airship. The Navy men and the civilians—engineers, pilots, draftsmen, fitters or riggers—who so faithfully worked on this great achievement deserve the thanks of the Nation.

St. Louis—the Aerial Magnet

FROM now until October all roads through the air will lead to St. Louis. Last year it asked for the annual air meet with assurances of the most practical kind. It has more than fulfilled the expectations of airmen. It is ready to act as host to American Aviation with true southern hospitality, which in this case represents an expenditure of $200,000.

Those who have not undertaken the preparations for an air meet do not realize the organization required and the many elements that need expert attention. St. Louis has already secured for herself a foremost place in air progress among the cities of the country by her whole-hearted determination to make St. Louis the aerial center of the United States. It is looking further ahead than the October races. Its preparations for the Third Air Congress are only incidental to the farseeing air program St. Louis has for the future. Located in the very center of the north and south mid-continental air route and a focal point for flying from all directions, St. Louis starts with a geographical advantage that is unequalled. With a modern flying field, an aroused civic interest in aeronautics and such a location, St. Louis looms large on the air map of the United States.

The places that have become the great railroad centers took an early interest in the railway development of the country. St. Louis can by a continued interest become, if she but wills it, one of the great terminal cities of the air routes that will traverse the country. Air mail will come to it soon with all the advantages to the city for expediting business with other cities. Rewards, far greater than now imaginable, will come to St. Louis as a return for its progressiveness.

Artificial Illumination for Landing Fields

By CHARLES STAHL

Manager, Illuminating Engineering Bureau, Westinghouse Electric & Manufacturing Co.

The lighting requirements for night flying can be met by several combinations of the following provisions:

1. Markers on the ship to safeguard against collision and to assist in dispatching.
2. Highpowered illuminants on the ship to illuminate landing space.
3. Beacon lights at landing fields for the pilots use as a guide.
4. Flood, cove, trench or subway lighting to illuminate and outline the landing areas.

Electric lights as markers on the ship can easily be provided and operated from battery or generator.

High powered illuminants, however, present a more difficult problem as to power supply, beam control and air resistance. In a forced landing at night the pilot should be able to search for a suitable area. This necessitates the use of

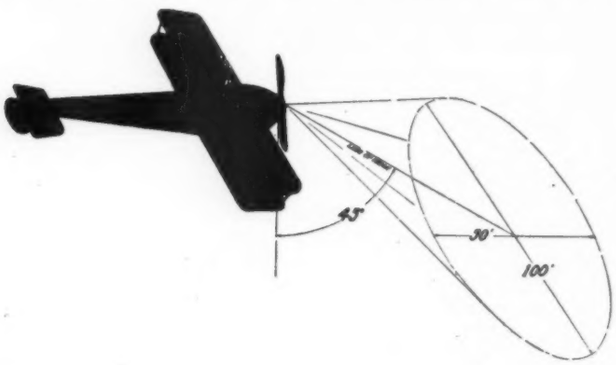


Fig. 1. In searching for suitable landing area a beam of wide side spread is desirable

lights, perhaps similar to the headlights on an automobile, but of different shape and more powerful, for the search cannot safely be made at an elevation of less than 100 ft. or at a speed much less than 60 mi./hr. Furthermore when searching in strange territory the pilot should be able to throw a beam ahead to reveal obstructions such as trees, buildings, etc., in time to dodge or hop over.

Airplane Searchlights

For a satisfactory inspection of the ground in searching for a landing surface, it is advisable to have a diverging beam or spread, preferably of an eliptical form with its major axis parallel to the wings of the plane, and its shorter axis paralleling the fore and aft center line of the ship as illustrated in Fig. 1. The position of this beam in searching may be in advance of the ship by an angle of 45 deg. with the vertical, however, after the landing spot has been selected, and as the ship settles, it should be possible for the pilot to increase this angle to about 75 deg. by swinging the beam ahead as shown in Fig. 2, so as to be able to observe the ground surface quite a distance in advance. The beam control therefore should be coordinated with the other manipulations incident to landing. As the ship descends the transverse axis of the illuminated area shortens and due to the decreased angle of incidence the fore and aft axis increases as shown by a comparison of the dimensions in Figs. 1 and 2. This is a desirable condition, for it lengthens the pilots forward vision. To produce suitable equipment for changing the direction of the light beam may require considerable study and development, for whatever type of lighting unit is to be used must not present an extensive surface forward because of the excessive air resistance caused by such surfaces. It may be possible to devise means of tilting reflectors or refractors so as to obtain the desired beam control. Another solution may be to use built in units within the forward body of the ship or within the wings, but both plans present certain difficulties and mechanical complications.

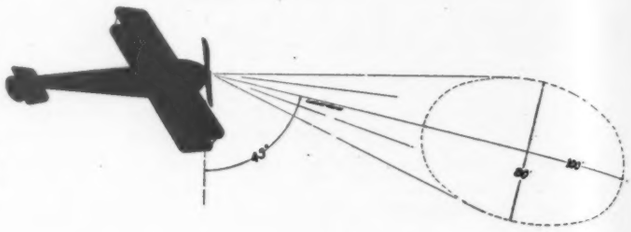


Fig. 2. In the final stages of landing less side spread and a greater forward length of beam is desirable

A possible form of built in wing unit is seen in Fig. 3 illustrating a design consisting of a parabolic reflector to direct all light downward to a hinged plate refractor with prisms shaped to throw the light forward at an angle of about 45 deg. when the refractor has its forward edge tipped slightly downward. Then by swinging the refractor upward the light beam may be shifted to point more directly forward in the last stages of landing or in taxiing. This construction is compact and causes little head resistance, and at the same time it provides the required flexibility in control. Such units could be compact and still operate at safe temperatures, for ample dissipation of heat is obtained when the ship is in motion. The same design could be built in the body and its ventilation handled in an equally satisfactory manner. Powerful units of this type could be operated from a generator and storage battery plant much the same as in modern auto-

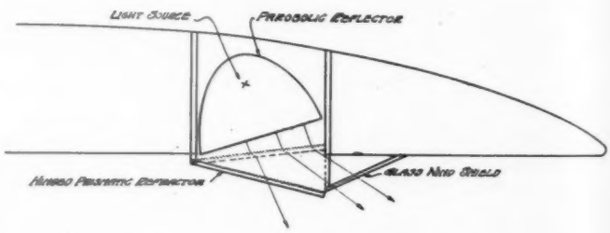


Fig. 3. Suggested built-in type of lighting unit placed in the wing of a night-flying plane

mobiles, although for airplanes the light output must be from four to ten times that of the average automobile in order to make night landings possible and reasonably safe. This can be done, for the scheme here outlined in a general way meets the requirements which at first thought appeared insuperable obstacles.

Under the provisions outlined in items 3 and 4 the necessity for equipping ships with field illuminants may be obviated if illuminated landing fields are spaced sufficiently close to enable the pilot, in case of engine trouble, to glide to the nearest field.

There are, therefore, two distinct and entirely possible means of making night landings, and therefore night flying,

possible and approximately, if not wholly, as safe as day flying; for it is known from accomplishments in other directions that the landing field, if necessary, can be illuminated so as to result in clearer vision than experienced under natural light on a cloudy day or under or within fog banks.

The Long Range Beacon Light

In the lighting equipment for a landing field the first provision to be made is a long range beacon light. This should be of such character that it can be readily distinguished from casual lights and of sufficient power to be visible to the pilot shortly after he leaves the preceding station. Obviously a strong searchlight beam is required for such long range, especially under severe conditions of snow, rain, fog or smoke. This beacon searchlight must be pointed slightly upward to make it possible for the pilot to pick up and follow the beam after he attains normal elevation.

The best direction for the beam seems to be approximately that shown in Fig. 4. It must be remembered that light itself is invisible and that a beam of light is visible only because of vapor, dust or smoke, in other words it is visible only in dirty atmosphere. At higher elevations the atmosphere becomes cleaner and therefore the presence of a light beam becomes less apparent, so the beam must not be directed at too great an angle from the horizontal. Following the beam by flying above it should under most atmospheric conditions be found easier than flying under the same beam directed at a higher angle. Fig. 4 shows approximately what elevation (angle) is correct in order that the pilot may pick up the beam at about five miles out from point *A* when flying at one mile elevation. It is not contemplated that the pilot fly down the path of the beam for he would then be subject to its blinding effect, but, having once picked up the beam he should have no trouble in paralleling it at a short distance.

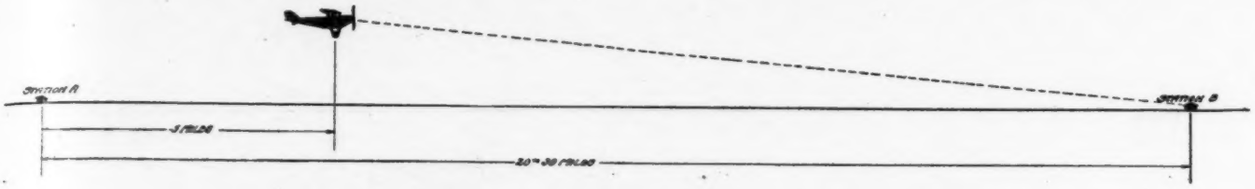


Fig. 4. A proposed scheme for following the beam of a beacon or searchlight

Because of the hazards that would be introduced, the use of overhead lighting equipment is not permissible in the illumination of landing fields. Experiments and studies have therefore been directed toward the application of flood lighting units or projectors. Such units can be placed at some distance from the actual landing areas or runways, but their locations must be carefully chosen to prevent glare. If in landing the pilot's eyes should, even for an instant, be subjected to the direct beam from a projector the result would in most cases be disastrous. To reduce the landing speed it is always advisable to head into the wind, in fact with a heavily loaded ship it becomes absolutely necessary under wind velocities of more than 30 mi./hr. The pilot is therefore not free to take the ground in whatever direction he chooses, and for this reason the runways are to be either in the form of a letter T or L so as to make it possible for the pilot to come in from one of four directions. This means that in the case of projectors it must be possible to illuminate both branches of the T or L from two directions so that light conforming in direction with the incoming ship may be used.

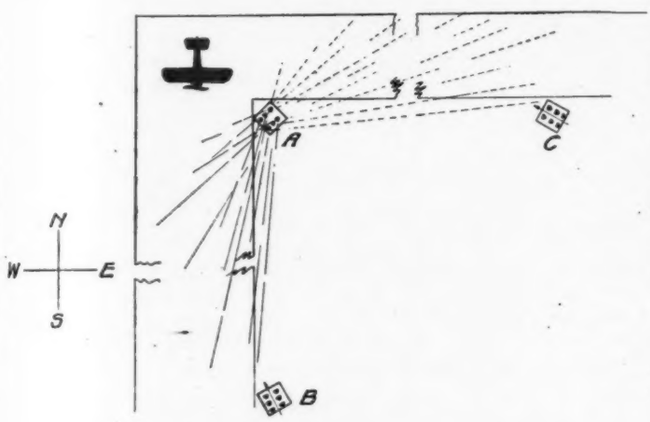


Fig. 5. The L type of landing field with battery (A) arranged so that by rotating it may be made to serve for landings from the north or west

Illuminating the Fields

Fig. 5 shows three batteries of projectors placed at *A*, *B* and *C*. This scheme may be employed on an L field using battery *A* as shown for a landing from the north and rotated to the position of the dotted arrow for a landing from the west. Battery *C* is trained for a landing from the east and *B* from the south.

Fig. 6 shows a likely arrangement of projectors for a T field in which instead of having one central battery as *A* in Fig. 5, it is divided into two parts, *E* and *F*, the combined capacity of which need be no greater than that of *A*. It will be seen that the T arrangement can be carried out with one less battery, for *E* and *F* can handle landings from east, west, or north. This arrangement, however, necessitates the use of either an extra operator or mechanical equipment to coordinate the settings of *E* and *F* from a central control position.

Another possible method of illuminating the landing areas is by means of side lights, which may be in the form of trough lighting, or by means of reflectors such as shown in Fig. 7. In case reflectors are used their effectiveness could be increased by the use of prismatic glass fronts to obtain a wide lateral spread of light. Such a system of lighting from the side lines has the advantage of reducing the danger of glare, but this may be more than offset by the objection that the pilot may misjudge or slip and crash into the equipment, which would in some cases be disastrous, since it is impossible to provide permanent units sufficiently light in weight to be torn away without disturbing the equilibrium of the ship.

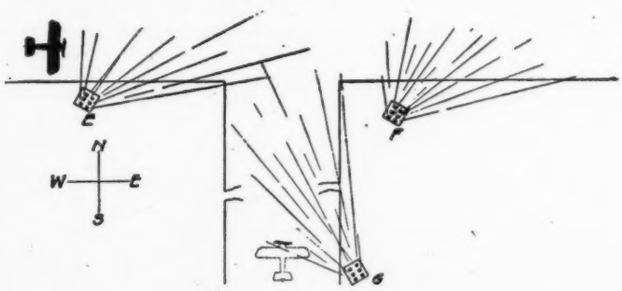


Fig. 6. The T type of landing field in which batteries (E) and (F) are rotated and interlocked to serve for landings from the north, east or west

Another suggestion is to outline the runways with subway

lighting having a covering of diffusing glass set in iron gratings flush with the landing surface. This would probably require supplementary lighting to produce a moderate illumination of the landing surface, although with the diffused outline lighting the pilot may be able to judge his position and elevation with sufficient accuracy, knowing the area within the outline to be perfectly smooth. The psychological effect and the degree of confidence created must be considered as well as the actual intensity of illumination obtained on the surface of the runway.

With a little experimenting it is fairly certain that satisfactory results can be obtained by one or possibly a combination of several of the methods described. Due consideration is being given as to what materials make the best runway surface. A white substance is best when considered purely from the standpoint of illumination.

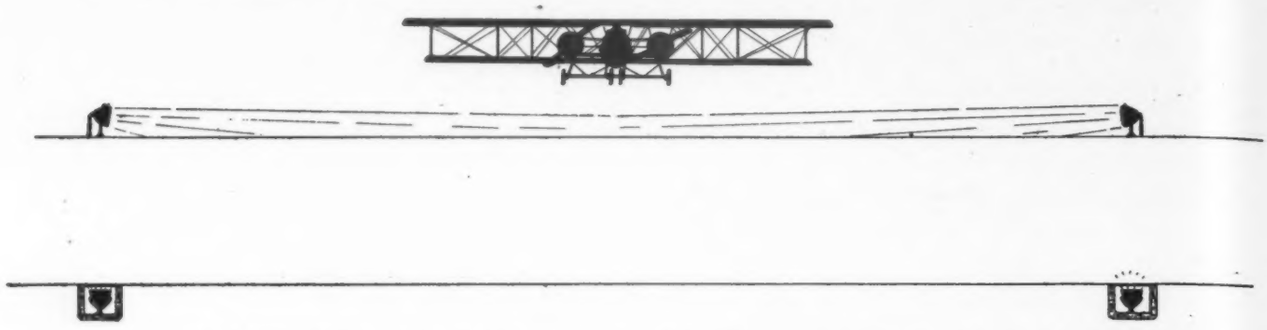


Fig. 7 Floodlighting from the side lines and outlining by means of units placed in manholes

Army Pilots Named for St. Louis Air Races

Large Number of Air Service Entries Assured for St. Louis Meet

Maj. Gen. Mason M. Patrick, head of the Army Air Service, announced on Aug. 20 the pilots and their alternates who will represent the Army in the International Air Races at St. Louis to be held Oct. 1-3 as shown in the appended table.

Including alternates the Army has entered 52 pilots and 26 planes in the observation, large capacity, high speed and pursuit plane events. All of the entries are from the regular Army with the exception of First Lieut. W. M. Outcalt of Cincinnati, who is assistant prosecuting attorney for Hamilton County.

Appropriations have not sufficed to provide satisfactory equipment in sufficient amounts to permit National Guard and reserve officers to undertake the training essential to preparation for these races. It is hoped that by next year the National Guard Squadrons will be in such a state of development as to permit entries in the International Air Races.

"The full benefit of these events," said General Patrick, "can be attained only when they play a part in the training of the Air Service personnel of all components of the Army of the United States."

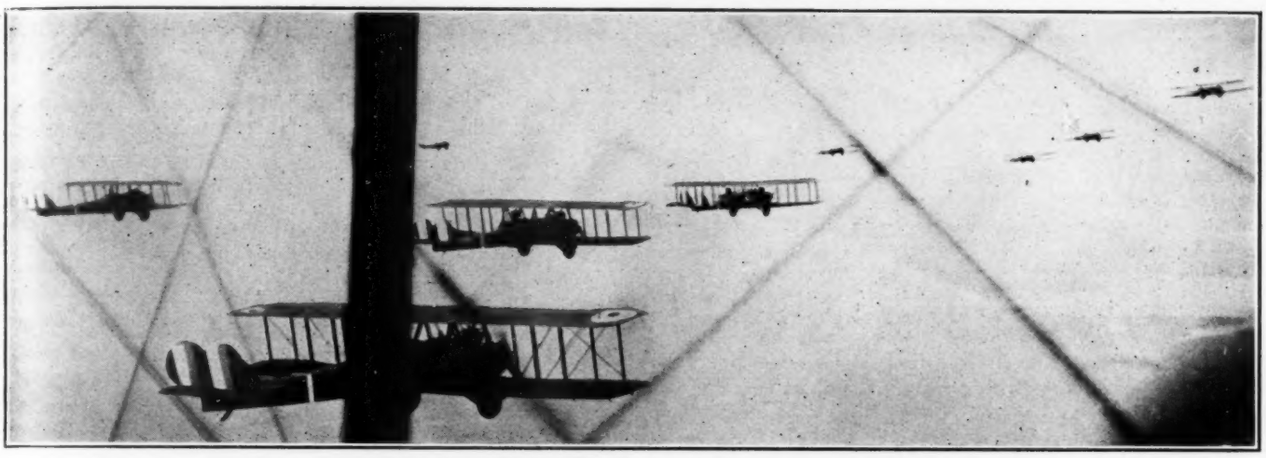
EVENT	*Type*	*Pilot*	*Station*	*Alternate*	*Station*
EVENT NO. 3					
Observation type, 2 passenger airplanes.	1 DH4B	Maj. Roy S. Brown	Maxwell, Fla.	Maj. C. L. Tinker	Riley
	2 "	1st Lt. J. J. O'Connell	Aberdeen	1st. Lt. E. M Powers	S.A.I.D.
	3 "	" W. H. Bleakley	El Paso	" W. A. Maxwell	Crissy
	4 "	" D. M. Outcalt (ORC)	Cincinnati	Major Robertson (ORC)	St. Louis
	5 DH4L	" H. K. Ramey	Bolling	1st. Lt. H. W. Beaton	Bolling
	6 XB1A	" W. T. Lawson	Kelly	" P. T. Wagner	Kelly
	7 "	" V. J. Meloy	Nashville	" A. S. Albro	OCAS
	8 CO4	" W. H. Brookley	McCook	" C. McMullen	Brooks
	9 "	Capt. R. Oldys	OCAS	" H. N. Heisen	Langley
	10 CO5	1st. Lt. L. H. Smith	Rockwell	" E. B. Bobzien	Chanute
	11 LePere	" S. M. Connell	Mitchel	" V. E. Bertrandias	Mitchel
EVENT NO. 5					
Large capacity airplanes.	1 Martin Bomber	Capt. E C. Black	Langley	1st. Lt. H. D. Smith	Langley
	2 " "	1st. Lt. L. Wade	McCook		
	3 " "	" L. P. Arnold	Bolling	Maj. J. H. Pirie	Aberdeen
	4 " "	" H. L. George	Aberdeen		
	5 T2	" H. G. Crocker	Kelly	1st. Lt. G. H. Beverly	Kelly
	6 DB1	" M. S. Fairchild	McCook		
	7 DT2	Pilot and alternate to be selected when definite assurance has been received that plane will be completed in time.			
EVENT NO. 6					
High speed airplanes. (Pulitzer Trophy)	1 Verville Sperry racer	1st. Lt. A. Pearson	McCook	1st. Lt. J. K. Cannon	Kelly
	2 Curtiss racer	" J. D. Corkille	Brooks	" H. H. Mills	Fairfield
	3 " "	" W. Miller	Crissy	" L. V. Beau, Jr.	Bolling
EVENT NO. 8a					
Service type pursuit planes. (Mitchell trophy)	1 MB3	Lt. T. W. Blackburn	Selfridge Field	1st. Lt. Leland Hurd	Selfridge
	2 "	" Thos. K. Matthews	" "	" Hobart R. Yaeger	"
	3 "	" Geo. P. Tourtellot	" "	" Arthur G. Liggett	"
	4 "	" Russell L. Meredith	" "	" Louis C. Simon	"
	5 "	" J. Thad Johnson	" "	" Edw. M. Haight	"

Air Service Makes Impressive Mobilization Test

Large Fleet of Martins and DH's in Initial Training Maneuvers Along Atlantic Seaboard

In the greatest demonstration of air power in this country since the World War the United States Air Service on Aug. 20 carried out a series of maneuvers under simulated war conditions in a flight along the Eastern seaboard from Langley Field, Hampton, Va., to Bangor.

In eight and a half actual flying hours a flying armada of sixteen Martin bombers negotiated the approximately 800-mile airway distance from the home airdrome at Langley Field to Bangor, a city "in danger," showing the feasibility of operating planes a long distance from their base. Augmented at Mitchel Field, near Garden City, L. I., by seven DH4B planes, the air armada presented an imposing sight from the ground as well as in the air.



Martin Bombers in battle formation in their flight from Langley Field, Va., to Bangor, Me.

Flying in various serial formations, the armada gave the populations along the coast a vivid idea of some of the experience European countries underwent during the war. Railheads and cities, factories and homes were thoroughly "bombed" by the aviators in their practice for a real emergency.

Impressive Start of Planes

At 4 a. m., Aug. 20, the eighty or more pilots, observers, radio officers and enlisted mechanicians were on the line making last-minute tests in order that nothing might go wrong. The pilots gathered around Maj. John N. Reynolds who commanded the flight for final instructions and then climbed into their planes. Maneuvering the bombers into one long line, they followed the lead of Major Reynolds into the air and rapidly assumed a V-shaped formation.

By the time the fleet was ten minutes away from Langley Field the planes had assembled into three groups, flying to the right and left and a little to the rear of Major Reynolds. Half way across the bay one bomber had to drop out for a reason supposed to be engine trouble. The other planes continued to their objective.

Flight Tactics

En route to Mitchel Field the planes went through offensive maneuvers such as bombing planes would be called upon to do in case of war. Sometimes the armada would proceed in a formation extending over an area of many miles. Other times Major Reynolds would bring his bombing forces so close together that it seemed as if one might bridge the space between wing-tips by a half-hearted leap.

Adopting offensive tactics, the bombers would swoop down on some objective like a railhead or a bridge and simulate the destruction of these aids to the "enemy." Especially over New Jersey were these offensive maneuvers undertaken, and had real bombs of 2,000, 1,100 and 600 lb. been used the State would have presented a scene of destruction. There was straightaway flying when Atlantic City was passed over at 9:30.

Communication Methods

The methods of communication adopted in directing the maneuvers were impressive. Frequently Major Reynolds would use a hand signal, which was relayed from bomber to bomber with amazing rapidity. Seemingly simple signals often resulted in intricate and long-drawn-out movements. Another form of signal was a manipulating of the plane, usually a short, quick motion which attracted the attention of the ever-alert observers. In instances where the commander desired to issue explicit directions he would use the radio, with which every ship was equipped. Thus with these three means of communication, any one of which could be used for the same end, the military regulations of a fleet of planes could be carried out.

Lower New York saw the armada pass over in close formation, each plane in its proper place. Plane Number Two on the right was directly opposite Plane Number Three on the left. Flying over the metropolis at the rate of 100 mi./hr., it seemed only a few seconds when the white markers on Mitchel Field appeared in view.

Then majestically encircling the field, each of the three groups came down, taxiing up to the hangars in full formation. Here the airmen were welcomed by Major Hensley, the commandant, and a crowd of air fans who had waited hours at the field for the appearance of the bombers.

Off for Bangor

After refueling and awaiting orders from Maine, the armada got off at 1:50 in its race to the aid of Bangor. Three of the bombers were delayed in making a second start, but later hopped off to rejoin the group. Apparently the bombers were in danger of being "attacked" by enemy planes, as fifteen minutes after the armada had started for Maine seven DH planes were dispatched eastward. Flying at a greater speed than the Martins, they overtook the armada just off Boston Harbor.

The bombers had intended making a stop at the Boston airport but Major Reynolds decided to make a single hop from Mitchel Field to Bangor. The DH's, under Maj. Junius

Jones, stopped at Boston for military reasons, among them to take aboard Elvin R. E. C. Herman, the Air Squadron cook, since an air force, like a marching army, fights on a full stomach.

The interest manifested in the air maneuvers made at Mitchel Field were repeated at Boston, where a large crowd hugged the edges of the landing field.

Maine Welcomes "Defenders"

The flight from Boston on presented the sort of terrain that makes pilots long for the day when the Government or some one will build suitable landing fields in the larger towns and cities with emergency fields at intervals. The heavily forested regions of New Hampshire and Maine and the rocky and lake strewn areas of the latter State gave the pilots of the bombers periods of undivided attention.

Bangor has a municipal landing field which meets all the requirements for bombers requiring large areas for landing and taking off. The knowledge of this landing field may have induced Gen. William Mitchell, Assistant Chief of Operations, to choose it as the objective for the present maneuvers.

The first group of the bombers arrived at the field about 5.30 p. m. (Standard Time), followed rapidly by the other groups and the DH's, the last of which came to a stop shortly after dark.

The armada attracted persons from many miles around this section. Spectators were impressed with the completeness with which the program for simulated war conditions had been carried out. Pup tents and tent equipment, cooking equipment and table ware, typewriters on which officers might grind the endless array of reports, and other requirements of a headquarters were unloaded from the interiors of the bombers

As indicating the interest among the public in the air force of our country, officers pointed to the requests which have flooded Washington and air stations to have bombers visit cities and towns.

Book Reviews

LE VOL A VOILE ET L'ASSOCIATION AERIENNE FRANCAISE. Official report on the Congress of Combegrasse and program of the Congress of Vauville. By Georges Houard. 180 pp., ill'd. (Association Francaise Aérienne, 17 Boulevard des Batignolles, Paris, France.)

This report on the First Experimental Congress of Motorless Flight, as the Combegrasse gliding meet was officially called, will be found of great interest by all those interested in gliding and soaring experiments. As this meet was the first held in France, and little information was then available regarding the most suitable kind of organization, the story of the meet and the lessons learned from experience give valuable pointers to all who intend to organize such events.

The report contains fairly detailed descriptions and illustrations of most of the gliders that participated in the meet, and relates at length how the various machines behaved and what their best performances were, together with the prizes won. A separate chapter is devoted to the experiences learned from the meet, and another to the rules of the Vauville gliding meet.

It is to be regretted that this report is not on sale, it having only been issued to members of the A.F.A. which organized the meet. It is, however, understood that a few extra copies are still on hand in the office of the A.F.A. and can be had gratis upon request.

GLIDING AND SOARING FLIGHT. By J. Bernard Weiss. With a Preface by C. G. Grey and an Appendix by W. H. Sayers. 164 pp., 8 plates. (Sampson Low, Marston & Co., Ltd., 100 Southwark St., London, England.)

The author of this book is the son of an English aeronautical experimenter, the late José Weiss, who devoted much thought to the problem of motorless flight and who built some remarkable gliding machines patterned after the shape of soaring birds.

The book itself is an excellent survey of the chief gliding experiments of Lilienthal, Pilcher, Chanute, Montgomery, the Wrights, Ferber, Voisin, Weiss, Etrich, down to our days, including the 1921 gliding meets held in Germany, France and England. While the book is essentially non-technical, it briefly outlines some interesting theories on the sailing flight of birds, such as the ones propounded by Dr. Hankin and Dr. Lanchester. It is to be regretted that the author has made no mention in this connection of the remarkable theories of Joseph Cousin and Knoller-Betz.

The book is highly to be recommended to all those concerned with gliding and soaring experiments, for it offers a sound summary of what has been accomplished in this art to date.

DECAYS AND DISCOLORATIONS IN AIRPLANE WOODS. By J. C. Boyce, Pathologist, Office of Investigations in Forest Pathology, Bureau of Plant Industry. U. S. Department of Agriculture Bulletin No. 1128. 52 pp., ill'd. (Government Printing Office, Washington, D. C.)

This bulletin describes the more important decays and discolorations to which woods in aircraft construction are subject and the conditions under which they occur.

AERO LITERATURE, 1910-1923. Catalog on Flying Literature published on occasion of the International Aero Exhibition, Gothenburg, 1923. 148 pp. (A.B.C.E. Fritze's Kungl. Hofbokhandel, Stockholm, Sweden.)

This catalog lists all the important contributions to the aeronautical literature published between 1910 and 1923. It is divided into eleven chapters, as follows: I. Official publications. II. Aerodynamics. III. Airplanes and Motors. IV. Balloons and Airships. V. Military Aviation. VI. Navigation and Instruments. VII. Meteorology. VIII. Medical. IX. Aerial Law. X. General aeronautical literature. XI. Periodicals and annuals.

French Air Force Plans

Under a bill now before the French Parliament, the French army air service would comprise the following tactical formations on peace footing:

132 combat (pursuit and bombing) squadrons;
76 observation squadrons;
18 balloon companies;
11 meteorological companies;
15 companies of riggers and fitters.

The strategical organization provides for two air divisions. The five anti-aircraft artillery regiments which have recently been attached to the directorate of artillery will remain in this status.

A bill providing for the reorganization of the French naval air service is also before Parliament. This bill provides for a peace strength of fifty plane squadrons and groups of kite balloons and airships, the number of which would be determined by the Minister of Marine. The fifty squadrons would be organized in five divisions, four being provided for coast defense work, and one for fleet duties. Under the organization tables several plane squadrons and balloon groups would form a naval air flotilla, and several flotillas a naval air division.

The bill provides for reserve equipment sufficiently large to keep the organization permanently in full strength. In addition to this normal reserve, there would be constituted a "special engine reserve" which would number three times the aircraft engines in actual use in the peace time formations.

Aircraft reaching obsolescence would be replaced in time to keep the formations constantly in a state of efficiency, and provisions for such replacements must be made twelve months before the aircraft reaches its "normal utilization limit."

For the operation of this naval air force it is contemplated to establish one central air base and four frontier air bases, in addition to instruction centers and auxiliary air stations. With the exception of the last named, all shore organizations of the naval air force would be on active status in peace time. The equipment required for organizing the auxiliary air station in case of war would, however, be provided for in peace time.

The personnel of the naval air force would comprise in peace time fourteen aviation battalions and two balloon and airship battalions.

Progress of Construction Work on St. Louis Field

Flying Field, Stands and Hangars Ready for October Air Races

By ARTHUR B. BIRGE

With the International Air Races at St. Louis, Oct. 1, 2 and 3 less than 3 weeks away, the eyes of the aeronautical world are focused upon what is being done at St. Louis in preparation for this epochal aeronautical event.

It is interesting to note that the first idea of W. Frank Carter, Joseph Pulitzer, Maj. A. B. Lambert and others, was to raise $45,000.00 to provide for the holding of the International Air Races, Aero Congress, Air Institute and Aeronautical Exposition at Scott Field, 35 miles away from St. Louis. Since the distance to Scott Field was so great it was deemed advisable to have these events take place near St. Louis. With that idea in mind and through the cooperation of Maj. A. B. Lambert, St. Louis Field at Bridgeton, 6 miles west of the city limits was procured.

Airplane view of Bridgeton Field, St. Louis, which has been especially constructed at heavy expense for the International Air Races, Oct. 1, 2 and 3

It was found, however, that even this ideal location would require an expenditure of $200,000.00 for the purpose of leasing, grading the field, erecting hangars, temporary grandstands, fences and other equipment. A permanent field of 183 acres was acquired at a purchase price of $74,000. Several hundred additional acres were leased at a cost of $15,000.00 to make the field large enough to accommodate all kinds of aircraft.

$200,000 Spent on Field

To raise this money a budget allocated to 104 industries a fair proportion of the amount of stock to be placed on the market and to cover the $200,000. required for the perfection of the field. It is gratifying to note that all of those interested have cooperated and that over two-thirds of the stock has already been sold.

Already $100,000.00 has been spent on the improvement of St. Louis Field, Bridgeton. Some idea of the amount of work done may be gained from the fact that 175,000 cu. yd. of earth has been removed. This is equivalent to the amount of average grade work necessary in the building of a 50 mile railroad. A square mile of territory had to be graded and in one place a 6 ft. hill removed and a creek which ran through the entire length of the field diverted. Moreover, a new channel had to be made for the creek and the old channel filled in. The total cost of this work, banking, grading, filling in, etc., was approximately $25,000. This work has been done so well that the tremendous cloud burst which occurred recently precipitating within an hour more rain than had fallen in the St. Louis area during the entire month of August, did damage only to a few hundred feet of the trench at its eastern end. For this work at one time as many as 150 head of mules and horses, 5 ten-ton tractors, 2 huge steam rollers, 5 elevating machines and 80 men were used. One square mile of earth has now been so well graded that a Ford automobile has driven over it at 45 mi./hr. with very little vibration.

The work of enclosing the field has been carried on very rapidly. Three and one half of the six miles of fence has already been completed. Woven wire has been put up on half the distance and 2000 fence posts have already been laid.

The great 10,000 gal. gasoline tank for supplying the ships has arrived and is now being put in position near the hangars. The roofs have now been put on all the steel hangars. These hangars measure 132 x 120 ft. and should accommodate approximately 25 planes each. The 120 x 150 ft. tent to be used for hangar purposes during the races has already been ordered and staked out. The machine shop measuring 25 x 50 ft. has been completely constructed and is now being equipped with the necessary tools and machines for adequate repair work on the field. The water tank containing 10,000 gal. is also completed and the water is being drawn from wells driven on the field so an ample supply will be available at all times for all purposes.

The 60 ft. pylon opposite the grand stand on the finishing line has been completed. The platform, 20 x 20 ft., should accommodate 12 persons. The judges stand measuring 18 x 25 ft. directly opposite the finishing pylon and the press stand, 18 x 25 ft., have also been completed. These two buildings have upper decks so that the races may be viewed from a sufficient altitude. Telephone booths, telegraph wires, instruments, etc. are being installed in the press stand and accommodations made for 100 newspaper men.

Seating Capacity of 70,000

Three thousand boxes, each seating 6 persons, have been completed making a total of 18,000 already provided for. Total seating capacity of the boxes will be 50,000, with 20,000 additional seats for other spectators. Room for parking 15,000 automobiles has also been fenced in. Every ticket sold also provides a parking space for an automobile.

Surveys have been made beyond the Missouri River for the two remaining pylons and the work started. Motor boats have been chartered for work on the river in case of necessity during the period of the races. All of the graded land has been sowed with rye which is coming up and most of the grading work on the 540 acres has been completed with the exception of a few of the smaller holes which develop from time to time due to rain or settling.

Already there has been a demand for 1000 boxes for the races. The important towns within 150 miles of St. Louis are being placarded with 24 sheet posters; streamers are being strung across the main highways; bill boards in the city are being covered with announcements of the races; automobiles are carrying stickers; trolley cars—directions to the Field; automobile clubs are going to paint directions to the St. Louis Field within 150 miles of St. Louis; newspapers, house organs, trade journals in and around St. Louis have been devoting a great deal of space to stories about the races; aircraft manufacturers have been routing exhibits to the aeronautical exhibit; the Speakers Bureau is putting on a form of speakers campaign in the theaters and the members are flying in a ship, loaned by the Curtiss Airplane Co., to all the surrounding towns within a radius of 150 miles distributing hand bills, delivering speeches at the fairs, Rotary clubs, chamber of commerce meetings and other clubs.

Already 42 entries have been received for the Races. A book of instructions has been sent out to members of the National Aeronautic Association, Aeronautic Chamber of Commerce and others interested containing directions for getting to St. Louis, and giving hotel rates, program of events, etc. From present indications over 200,000 people will attend the International Air Races and it is anticipated that several hundred aircraft will be at St. Louis during this period. The Sperry Gyroscope Co. has loaned its searchlight which has a radius of over 100 miles and a candle power of 450,000,000 for the purpose of publicity.

All of the people in and about St. Louis are looking forward to the International Air Races and Aeronautical Exposition as the greatest event that has taken place in St. Louis since the World's Fair.

News From St. Louis

Charles F. Hatfield, chairman of the Convention Committee, has received the acceptance of Senator Selden P. Spencer to serve as toastmaster at the great Aero Congress Banquet to be given at Hotel Statler, Oct. 1.

Army Entries Received

The United States Army entries for the air races, as given out in Washington and published in the daily papers and in AVIATION last week, insure splendid competition in the four events in which the army will compete.

Comparison shows that in Event No. 3 (Observation type 2 passengers airplanes) for the Liberty Engine Builders' Trophy, the Army will have eleven entries and the Navy two. In the class for large capacity planes, for Merchants Exchange Trophy, the Army will enter seven contestants and the Navy two. In the Pulitzer Trophy Race for high speed planes, however, the Navy will have four entries, while the Army will have but three.

Entries for On-to-St. Louis Race

The following entries for Event No. 1, the On-to-St. Louis Race, for Flying Club of St. Louis Trophy, are reported since the last Bulletin:

Robert M. Cochrane, Casper, Wyoming, flying Lincoln Standard Tourabout; 150 hp. Hispano-Suiza engine.

Miss Daisy Smith, Spokane, Wash., JN4DC 6 Motor; 150 hp.

Duncan A. McIntyre, Tulsa, Okla., Bristol, 200 hp. Hispano.

Charles J. Glasser, 4216 Calumet Ave., Chicago, LeRhone 80 hp. engine.

Ludington Exhibition Co., 609 Widener Bldg., Philadelphia, Pa., Farman Sport, 60 hp. Anzani.

Curtiss Exhibition Co., Garden City, L. I. Curtiss Oriole, OX5 90 hp.

THE NEEDS OF AMERICAN AVIATION

By HOWARD E. COFFIN

President National Aeronautic Association

Less childish suspicion and antagonism between groups and a more sincere and unselfish cooperation for the national good.

Fewer people thinking "What can I *get* out of aviation" and more thinking "What can I *do* for aviation."

Full recognition of the seriousness of purpose with which aviation development is being undertaken by foreign nations and the inevitable bearing of these policies upon the future of our own national defense.

The adoption by the United States government of a definite, comprehensive and continuing policy of air development covering an advance period of at least five years.

Federal legislation which will make flying a safe and sane means of every-day service and travel; which will curb present abuses and promote public confidence; which will encourage and protect financial investments by the public in future aeronautical transportation enterprises; which will prevent conflicting regulation by forty-eight states.

The creation of a commercial air fleet as a vitally necessary reservoir for the supply of men and materials to our military and naval forces in the event of a national emergency. The conversion of the outstanding achievements of our American engineering and technical skill to the practical needs of our people; the education of the general public and particularly of our business men to the value of aviation as a transportation factor in the commercial development of our country and to the relative advantages of "Air Time versus Rail Time."

A National Aeronautic Association of 100,000 members to give direction and expression to public opinion in all matters touching aviation; to serve as a channel for the transmission of information; and to wield its great patriotic influence to make "America First in Air."

To Fly from Dallas

The Curtiss Co. has loaned the Air Board the use of a serviceable JN ship, for the purpose of carrying an Aerial Advance Agent about the country, advertising the International Races. The ship is now at Dallas, Tex., and a pilot will be sent to bring it to St. Louis covering important cities and gatherings on the way.

Report by Mr. Shaw

A number of entries were received last week, particularly in the "On-to-St. Louis" race, two entries in event No. 2, and one in event No. 4. This is very encouraging, for most civilians generally manage to come in at the last minute. We have received assurance from a number of other important prospective contestants that they will have their entries in within the next few days.

Polish Air Derby

The Polish air derby held Aug. 5 over a triangular course from Warsaw to Lwow, (Lemberg), Poznan and back to Warsaw, a distance of 1245 kilometers, or 775 miles, was won by Lieutenant Gedgowd. The elapsed time was 13 hr. 25 min. but three stops greatly reduced the total flying time. Climatic conditions were most unfavorable, and visibility very low.

How Banks Can Benefit By Aerial Transport

The Possibility of Eliminating Time Delays Should Be Of Immediate Interest to the Banking World

By JOHN G. LONSDALE

President, National Bank of Commerce, St. Louis

Even the most aggressive banks never bestir themselves to the early adoption of frills. American bank progress as substantial as Gibraltar, is surely a measured evolution; never an onrush of untried modernisms. It is perhaps natural, from the very conservative nature of their business, that banks should seek, or rather await for adoption only the proven quantities and practices of the commercial world. The question arises, though—when does an innovation become proven? When does the period of approbation or experimenting cease? When do new departures become sufficiently shopworn for adoption? No review is necessary to draw the obvious parallel of a bank with and without telephones, telegraph, typewriters or bookkeeping machinery. America's vast volume of business would be impossible without these time-saving elements. The one incessant pursuit of business down through the ages has been the elimination of space, and the successive expansion of commerce within given areas has grown with each newly-discovered annihilator of distance.

It is natural for us, then, to conjure the practical application of aerial locomotion to business, more particularly to banking.

"What Can We Do With It?"

Interest in this is quickened in the Middle West by the holding of the International Air Races in St. Louis, Oct. 1, 2 and 3. Flying, and its rapid—almost miraculous—peace-time development, is being impressed on the thinking people of the Mississippi Valley in a matter-of-fact, "what-can-we-do-with-it?" way.

When those who know predict that machines will move through space as fast as 250 to 300 mi./hr. at the St. Louis meet, and when the fastest trains or reliable auto service is around less than a third of this time, the place of the airplane as a "thief of time" stands out pre-eminently.

Banks deal more properly in credits than money. Efficient, constant and judicial employment of the funds of the depositors gage the volume and the earning capacities of our banks. Time, therefore, as in the copybook axiom, is money, more particularly to the banker. In fact, time is really the element, and not specifically credit or money, that banks deal in. The possibility of saving or eliminating the time delays should be of immediate interest to those responsible for our financial life. One of the banker's biggest problems is the amount of his cash and sight exchange items, the status and earning powers of which are neither uniform nor certain.

Narrowing the Continent

Moving San Francisco eastward to where Chicago now is located—which is what happened in transportation hours when the 26 hr. transcontinental flight was made—obviously has a bearing on the transportation of tangible credits, or, rather, the exchange of funds by customers' check. Reducing the most distant points within the nation from four and five day points to a minimum of two days ought to prove a money-saving procedure.

The time during which customers' checks are outstanding between banks for collection is commonly called "float." As long as a country bank check remains in "float", someone—exactly who is sometimes a much mooted question—must pay interest on the amount. It is not money until collected.

At first glance, it would seem obvious that reduction of the transit time would effect an interest-saving which, in a national total, would be enormous.

The fact is, however, that in speeding up the actual transaction of exchange, you correspondingly decrease the amount of money on deposit where the volume of trade is equal. Seemingly, then, the speed-up would work to the advantage of the section or community with the greatest trade volume. A review, however, of the gold settlement fund—the basis upon which the Federal Reserve equalizes trade balance—shows that the advantage of trade is pretty equally distributed over the United States. From a dollar and cents standpoint, then, this most obvious reason for greater dispatch is minimized.

Some Interesting Figures

Just to show the volume of business that would be involved from St. Louis alone, that would be at least speeded up, if not specific interest saving were eventually shown, C. C. Attebery of the St. Louis Federal Reserve Bank has gathered some interesting figures. The average daily amount forwarded from St. Louis over a given week was as follows:

Boston	$ 261,000.00	Baltimore	$145,000.00
New York	2,630,000.00	New Orleans	367,000.00
Philadelphia	305,000.00	Detroit	204,000.00
Cleveland	170,000.00	Minneapolis & St. Paul	130,000.00
Pittsburgh	188,000.00	Dallas	350,000.00

Even the novice could visualize the advantages to be gained by the community first transporting its exchange checks aerially, and yet its immediate adoption, once started, by all large centers would soon overcome this temporary benefit.

Mr. Attebury also compiled a table showing comparative transportation time on the amounts quoted in above table.

	Time required for clearance by rail transportation:	*Time required by airplane transportation*	*Saving by Airline*
Boston	Three days	Two days	One day
New York	Two "	One day	" "
Philadelphia	" "	" "	" "
Cleveland	" "	" "	" "
Pittsburgh	" "	" "	" "
Baltimore	" "	" "	" "
New Orleans	" "	" "	" "
Detroit	" "	" "	" "
Minneapolis & St. Paul	" "	" "	" "
Dallas	" "	" "	" "

As an indication of the freightage involved, and the fact that in volume the loss to the rail carriers would be negligible, the amounts named in the first table would weigh as follows:

Boston	2 lb. 10 oz.	Baltimore	2 lb.
New York	13 lb.	New Orleans	6 lb. 9 oz.
Philadelphia	3 lb. 8 oz.	Detroit	1 lb. 5 oz.
Cleveland	3 lb. 7 oz.	Minneapolis & St. Paul	5 lb.
Pittsburgh	2 lb. 13 oz.	Dallas	9 lb.

On a basis of 6 per cent on the volume shown above, airplane transportation in saving on the average of one day to all points named would mean an economy of nearly $800 a day in interest. A saving, however, that would not be fully realized on when all points began using planes.

Service not Expensive

Now, as to the charges to be made under which aerial service with this volume of business can be profitably done, and whether the rate for carrying would be great enough to outweigh the advantages gained is undeterminable with data at hand. However, one firm of aviation engineers, I understand, is making a survey of the volume and believes the establishment of such a service is feasible upon a reasonable cost basis.

Whether the aerial service should be a Federal Reserve function is subject to discussion. Many favor the individual bank assuring the volume, dispatched through the central agency of the Reserve Bank. This detail is entirely parenthetical to the utilization of this faster means for transportation of exchange items.

So far, the seemingly readily apparent gains from the more

modern air carrier are partially reduced or eliminated upon analysis: One city using airplanes would reap a decided financial gain in the time saved, but no one could so monopolize the situation once the departure was inaugurated; the saving in interest days would secure also advantageously if trade balances were not so evenly distributed, and the quicker disposal of interest did not correspondingly decrease bank deposits.

What, then, are the promises for considering the airplane's use for banks? First, because it is a proven modern carrier—Charles Schwab says, "Our children will fly"—and so they will, and we do not want banks to be the last in this vision. Aviation, therefore, is an economic factor to be developed not only through the resources of banks, but with their help where applicable.

Greatest Benefit to Business

In this business congestion set up and added to daily by men's ingenuity, the greatest avenue for development lies in the dispatch with which business is transacted. Air mail represents the last word in shortening distance and the commercial possibilites of the air are only now dimly imagined. Buckling wings of Mercury to the interest-bearing bank mail represents greater business service—the keynote of our national progress. Whether the banker gains directly or not, the greater efficiency and turnover it would represent to the dealer, the merchant, the bank customer makes it a desirable course of development.

Incidentally, and purely so, to the last paramount reason of service of greater dispatch is the added stability it would lend to the credit fabric of the country. The time of suspense when the payees' responsibility is being established is an accountable factor commercially. The "float" of bad checks, the use of "float" by some to temporarily increase their working capital and a hundred and one abuses of the "float" system, all dangerous, costly and adding to the uncertainty of safe business practices could be reduced, if not eliminated, under more expeditious methods of air transportation for exchange items.

For Emergency Uses

In lesser capacities there are many banking services where speed is a vital element.

One morning last summer a bank in Illinois called and said their cashier had gone fishing for a day and that they were unable to get the vault open for the day's business. It took about an hour and a half by automobile, an airplane could have made it in one third the time.

On still another occasion, we had a call in the wee small hours of the morning from a correspondent bank for a large cash shipment. One of the banks in their town had closed the day before and bank depositors were a bit fretful. We were fortunate enough in this case to get the money there before the bank opened. There would never be any trouble in rendering emergency service within a radius of 300 to 500 miles with airplanes.

Aviation Here to Stay

Commercial aviation, one of the few respectable children born of the war, is an accomplished fact. Air traffic cannot come without established landing fields and hangars. It is as dependent upon these facilities as railroads and boats are upon adequate terminals. St. Louis is not only advantageously located to tap the developing air lanes of commerce and adjacent to the largest lighter-than-air landing place of Scott Field, but is constructing a commercial air terminal only six miles from the city's gates. More than $200,000 is being expended on a field one mile square with every ground facility for modern flying at Bridgeton, a St. Louis suburb. With these permanent air terminals St. Louis will have as good if not the best commercial flying field in the country, outside of government-owned facilities.

St. Louis as an Air Port

Thus early in the development of air carriers St. Louis becomes an airport of unquestioned facilities, a condition that is bound to direct the attention of those most interested in the perfection of such transportation. St. Louis with this equipment will be the logical clearing point for both transcontinental air traffic and the growing trade territory of the Southwest. It behooves business men, both big and little, to give attention to this new growth that portends not only great things for St. Louis, but for the territory served. A financial air service should not be the least or the last feature added to St. Louis' air leadership.

For the sake of our common progress, we bankers must think on these things. Not only must we know our business, but be able to see it as it goes—as it grows. Some of our past banking program has been too ponderous, and while none would advocate the trivial, banks should be but the average reflection of our best business minds, and they in all the deliberation can see the caravans of the air, the commerce carrier of tomorrow, borne on the wings of the morning, not competitively, but cooperatively with our great national transportational facilities.

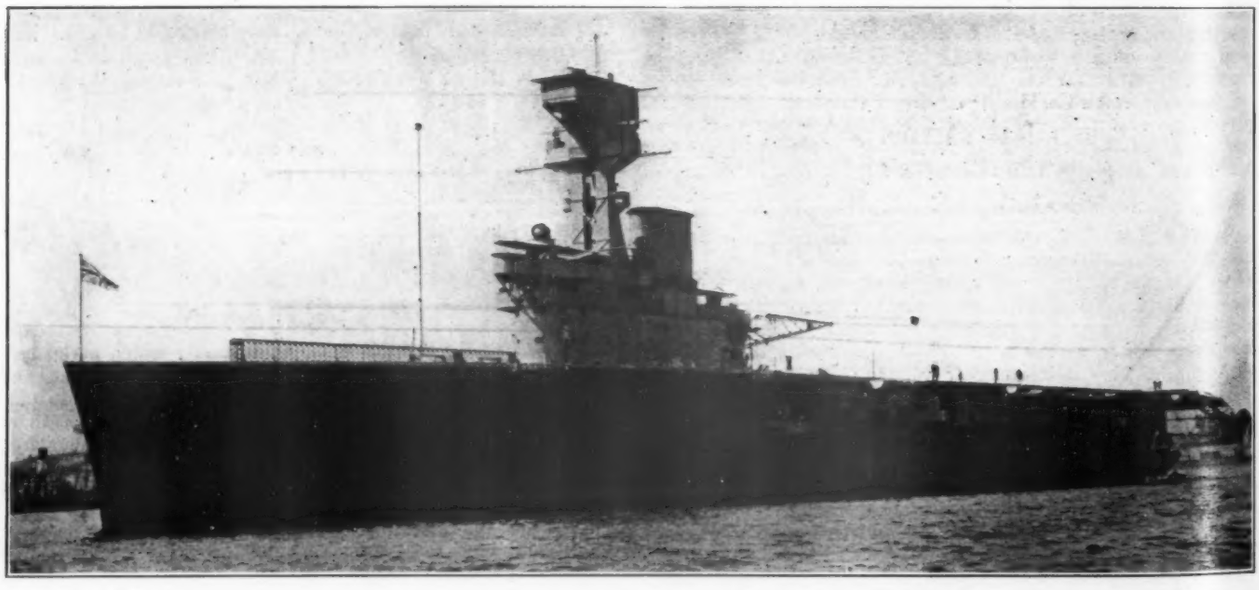


Photo Central News

Great Britain's first, specially designed aircraft carrier, H. M.S. Hermes—Displacement, 10,950 tons; speed, 25 knots; plane capacity, 20; armament, seven 6 in. guns and four 4 in. anti-aircraft guns

First Trial Flight of U. S. Naval Airship ZR1

American Built Rigid Successfully Flown at Lakehurst, N. J.

The United States naval airship ZR1, the first American built rigid, successfully accomplished her first trial flight on Sept. 4, at Lakehurst naval air station, in the presence of a large crowd which included some notable figures in the aircraft world.

Weather conditions were well nigh perfect, when at 6 p. m. the big ship was walked out, stern first, from the gigantic hangar, under the combined pull of some 300 sailors and Marines who manned the handling ropes. The crew of twenty men was already on board, with the exception of Comdr. Frank R. McCrary, U.S.N. commander of the ship, Comdr. R. D. Weyerbacher, U.S.N. who supervised the assembling of the ZR1 at Lakehurst, and Capt. Anton Heinen, airship expert of the Zeppelin Co. who has acted as a consultant to the Navy in the construction of the craft. These three men supervised and directed the movements of the ZR1 out of the hangar to the center of the field, where the runways ended.

As soon as the guy ropes were released from the tackle of the runways the sailors pulled the ship around until her nose was in the wind. At this time Rear Admiral W. A. Moffett, chief of the Bureau of Aeronautics, who had come on from Washington in a Navy DH4 specially for the occasion, and who was under the big ship wished the airmen "bon voyage."

"Let 'er Go!"

Commanders Weyerbacher and McCrary and Captain Heinen then climbed into the control car. On the order given by Commander Weyerbacher to "let 'er go," the handling ropes were cast off, and the silver hulled airship gradually rose in the air while the two aft wing engines were started. These engines have reversible geared down propellers to facilitate maneuvering in and out of fields. The ship was still rising horizontally, when the forward wing engines—with direct drive propellers which turn at a much higher rate of speed—were started and the ZR1 put her nose up and started climbing out of the field at a good angle. Having reached an altitude of 1200 ft. the ship headed for Toms River. She seemed to handle satisfactorily in the air, although only four of her six engines were used in flight. The aft engine was not used at all, while the forward engine was only run for a few minutes prior to landing, to head the ship well into line with the hangar.

After she had been in the air a little more than twenty minutes an orderly came up to Admiral Moffett and handed him a radio message which had been sent by the ZR1. It read:

"To Admiral Moffett from ZR1: After twenty minutes' flying all going well. M'CRARY."

Shortly after this the big ship was seen to turn in the air and head back to her home field. The handling crews were already back at their posts ready for their unaccustomed task. As the ship came over the point where she was to land a huge red-white-red ground strip was spread on the field to indicate the direction of the wind and the fact that all was in readiness. Alongside were electrically illuminated instruments which indicated the barometer reading, temperature and force of the wind.

Owing to the late start, it was already dusk when the landing operations commenced. The battery of searchlights on top of the hangar were turned full on to the streamlined hull of the giant airship, giving it a most impressive appearance.

Then two handling ropes came out of the nose of the ship with lightning-like speed and fell in the center of the circle formed by the landing crew. They were quickly caught and within two minutes the ship was upon the ground, completely under control of the crew.

As she was held there Commanders Weyerbacher and McCrary and Captain Heinen jumped out. Smiles had replaced hard-drawn lines upon their faces and clearly indicated the relief the successful trial flight had brought to them.

The ship left the field at 5:50, Eastern standard time, and maneuvered for landing at 6:40. She was under complete control by 6:45 p. m. Commander Weyerbacher said no valving had been necessary and consequently none of the precious helium gas had been lost.

At no time during the flight were the engines turning over at more than half speed.

"The flight was highly satisfactory," said Commander McCrary. "The craft steered exceedingly well, although we did not carry out any tests of severity on the initial trip. We only opened up the motors to half speed, and they functioned entirely to our satisfaction. The ship proceeded smoothly and evenly, as evidenced by the fact that Lieutenant Bauch, one of the passengers, and an enlisted man were able to walk on the roadway on top of the gas bag.

"There are a few minor changes we will have to make before we can take the ZR1 out again. We plan a series of test flights, the second probably the latter part of next week."

Admiral Moffett Enthusiastic

Rear Admiral Moffett was enthusiastic over the results of the trial trip. He said:

"We have now got the largest active rigid airship in the world. If the ship works well, we will send her on a flight to the North Pole. It won't be this month, of course, but it may be next year.

"Every effort should be made to conserve the helium resources of this country. It is a crime the way this precious gas is going to waste. The government should preserve the land where the natural gas is found. I understand that in twenty years this supply will be exhausted."

A little flurry of excitement was caused just before the ship was brought out of the hangar, when sailors atop the big structure set off a smoke bomb to indicate the prevailing wind, and an excitable civilian employee started shouting "The roof is on fire!" Fire bells rang and whistles shrilled loudly for a while until some loud speaking megaphones straightened out the tangle and everything subsided into the scheduled calm. Incidentally, the entire operation of walking out the ship, of letting her off and of bringing her again into the hangar, was performed with clocklike precision and an absence of any rushing to and fro which was very marked and speaks volumes for the training of the Naval Air Service. Every man seemed to know his place and his task, and everyone acted accordingly—which was very inspiring, considering that none of these crews had previously handled an airship of this size.

Among those who witnessed the maiden flight of the ZR1 in addition to Admiral Moffett, mentioned before, were Comdr. J. C. Hunsaker, U.S.N., Chief of the Design Division, Bureau of Naval Aeronautics; Comdr. G. C. Westervelt, in charge of the Naval Aircraft Factory, Philadelphia; Grover Loening, the aircraft constructor, and numerous Army and Navy air officers from nearby fields and stations. Three Army DH4's from Mitchell Field and a civilian "Jennie" also landed visitors, and looked very puny in comparison with the huge ZR1, as did two Elias expeditionary planes which were housed in the airship shed.

The ZR1 has a capacity of 2,115,000 cu. ft., and measures 680 ft. in length overall, 78.7 ft. in maximum diameter, and 93 ft. in height. The streamlined hull, with 25 faces, is built of longitudinal and transverse girders of general Zeppelin form, wire braced and fabric covered, and contains twenty gas cells. From the hull are suspended the control car, forward, and five engine cars, as may be seen from the cover illustration of this issue. Each of the six cars is equipped with a 300 hp. Packard airship engine, the forward, outer wing, and after cars having geared propellers, while the inner wing cars have direct drive propellers. The geared propellers are 16 ft. in diameter; the others 12 ft.

AIRPORTS AND AIRWAYS

This Department is concerned with all civil flying activities such as the establishment of airports, the marking of airways, warnings to airmen regarding obstructions, experiences gathered on flying routes and landing fields, the work of commercial aviation companies and private fliers, the formation of new air transport enterprises, personal paragraphs of general interest, etc.

Communications to this effect, addressed "Airways Editor, Aviation, 225 Fourth Ave., New York City", should be brief, accurate and to the point. They should deal with facts, not with theories or speculations. While American civil flying activities will naturally be given prominence, communications will also be welcomed from Canada, Mexico and other parts of the Western Hemisphere. EDITOR.

Chicago News

Severe rainstorms and the slushy condition of the fields kept most of the ships in their hangars last week. Nimmo Black has arranged for space at the Chicago Fair, which is being held during the week of Aug. 28 to Sept. 3 at the polo grounds directly opposite his field, and will very likely exhibit one of his new JN4Ds. Black has offered the Fair a strip of land along the road the entire length of his field for parking cars, which will in no way interfere with flying and will undoubtedly bring some trade to his field.

The Heath Airplane Co. has made arrangements to fly at the Cook County Fair at Palatine, held during the same week as the Chicago Fair.

John Miller of the Edgewater Beach Air Service is installing a new 180 hp. Hisso in his Seagull to replace the Curtiss C6 formerly used. As soon as the change is completed and the lake calms down he will resume his passenger carrying activities at the Edgewater Beach hotel.

The Lincoln Park board will take up at their next meeting, Sept. 12, the advisability of making the recently reclaimed land at the foot of Grace street into an airport. It is expected that the recommendations of the Uptown Chamber of Commerce and the Uptown Improvement Association will help to put it over. Plans, as laid out by Otto Klein, aviation editor of the Uptown Chicago *Times*, provide for a three way field, combined with a water airport a mile in length, with service station to accommodate both land and sea planes. The proposed field is only a 20 min. bus ride from the Loop district.

The Heath Airplane Co. has now under construction two huge 15 ft. propellers, which were ordered for helicopter experiments.

Dr. R. R. Ferguson, Chicago's eminent aviator physician, has returned from an air trip to Minneapolis. The doctor left Thursday in company with pilot Jimmie Curran, returning Saturday.

Henry C. Etton, who manages to get away from the electrotyping business every day long enough to take a spin in his beautiful and newly re-covered Jennie at Ashburn field, has secured an advertising contract with the Heco Envelope Co. to display the company's trade mark to Chicago sky gazers whenever he happens to fly. Mr. Etton also offered several flights to winners of the model airplane competition, held here last week.

The power and speed contests of the model airplane meet, which were postponed until Aug. 25, were both won by William Schweitzer of 4264 Hazel avenue. Schweitzer was one of the first members of the Illinois Model Club and has several remarkable records to his credit. His power model, incidentally the only one entered in the contest, has a spread of 6 ft. and chord of 8½ in. It is powered with a three cylinder compressed air engine carrying a "gas" tank of aluminum, some 2 ft. in length. This model won Schweitzer a beautiful silver cup and an Underwood typewriter. A small double propeller tractor model won the speed contest, making between 38 and 40 mi./hr., as close as it can be figured.

The Lennert Triplane, which was built several years ago, but which had never been flown, was recently successfully flown by Elmer Partridge at Ashburn field. It is a single seater, designed for exhibition work and is powered with a Gnome 100 hp. engine.

For the first time in the history of Black's Airport a big Army DH set its wheels on the field Sunday afternoon, Aug. 19. Many big ships have circled over the field in the past, but none seemed to feel safe in landing in such a small field. The DH mentioned had visited all fields in search for another plane of the same type, supposed to be stranded at a local field with a burnt out switch. Lieutenant Givens, who piloted the plane, had no trouble getting into or out of the field. In taking off he made a climbing turn down wind immediately after leaving the ground.

John Huber, a student at the Lake View high school, has completed his Canuck and has set it up at Black's field. The ship is of natural finish with deep blue cowlings and struts and is without question one of the most attractive jobs turned out in a long time. Huber is 16 years old and will complete his flying instructions in his own ship within the next few weeks.

Nimmo Black returned a few days ago from a series of cross country trips with pictures of the Harding funeral. He met the funeral train at Omaha, brought pictures to Chicago and other points; then again met the train at Marion, taking pictures from there to New York. He used the Laird Swallow, which has already taken him to Florida three times.

A Case of Mistaken Identity

Several of our French aeronautical contemporaries announced on the strength of a press dispatch which must have been considerably garbled in the transmission that the Barling Bomber was crashed during its trial flight and that its crew was severely injured.

As a matter of fact nothing of the sort happened to the Barling Bomber, the tests of which are proceeding at Wilbur Wright Field, Dayton, Ohio. What apparently gave rise to this erroneous report was that on July 15, when the trials of the Barling Bomber were scheduled to begin, the Remington-Burnelli air liner had a forced landing at Miller Field, Newdorp, S. I., and stood on its nose, injuring the pilot and shaking up the crew. As this machine has seating accommodation for 35 passengers, which the newspapers duly mentioned in their accounts of this incident, foreign newspaper correspondents evidently mistook the R.B. airliner on account of its great size for the Barling Bomber.

Successful Hotel Air Service

Three Curtiss C6 Orioles maintain a daily flying schedule between Garden City, L. I., and Dixville Notch, N. H., a town seven miles from the Canadian border. The distance between the two towns is 350 miles which is covered in the average flight time of 4 hr. The service was established mainly for the transportation of the New York morning newspapers to the guests of "The Balsams" Hotel at Dixville Notch, but since it has been in operation passengers have also been carried. The planes carry as high as 800 newspapers per day, as well as personal messages between the Garden City Hotel and "The Balsams." Since the service was started, on June 23, the planes have been leaving Garden City between 4.00 and 5.00 a. m. covering the 350 mi. to "The Balsams" by 9.00 a. m. or

an average of 4 hr., as against a 36 hr. run necessitated by rail travel.

These ships have been standing up exceptionally well under this continual usage. Although the Green and White Mountains are obstacles to the flight, the gasoline mileage has been less than 11 ga. per hr. The planes have flown altogether about 500 hr., the average engine time being 150 hr. One plane has gone 198 hr. without even top overhauling. Only eight days have been missed on account of fog and the only mishaps have been slight propeller and radiator trouble. The service will be continued up to Sept. 15.

The service was inaugurated on June 23. It is known as the Balsams Garden City Aero Corp., Paul T. Deyo, president and was contracted for with J. J. Lennon Co., proprietors of both hotels, at a weekly operating cost of $700. The personnel includes three pilots, and one mechanic at each end. The pilots are: Egbert P. Lott, Andrew H. Heermance and William Sharp.

Planes for Mine Rescue Work

The adaptability of the airplane to a novel use is being tested by the Department of the Interior at Birmingham, Ala., where experiments looking toward the use of planes in rushing the trained mine-rescue men of the Bureau of Mines to the scenes of mine disasters are being made. A landing field has been located at Carbon Hill, an Alabama coal mining town, and other fields will be located at mining towns within reasonable flying range of the mine-rescue station of the Bureau of Mines at Birmingham. Trial flights of planes carrying Bureau of Mines trained men equipped with oxygen breathing apparatus have been made between Roberts field, Birmingham, and Carbon Hill.

Recently two planes of the Alabama National Guard, each carrying a National Guard pilot and a Bureau of Mines engineer, transported five sets of rescue apparatus from Birmingham to Carbon Hill, a distance of 60 miles, in 46 min., or at the rate of 80 mi./hr. It is estimated that the minimum time that would have been required by a special railroad engine to cover the distance with a clear right-of-way would have been 3 hr., while an automobile truck proceeding over the roundabout public roads would have required 4 hr.

In ordinary rescue work following explosions and fires, it is standard practice to use not less than five sets of oxygen breathing apparatus for the rescue of possible entombed miners and in the recovery of bodies. It is necessary to use oxygen breathing apparatus in the poisonous and irrespirable atmospheres which are generally found after explosions and fires. The apparatus used in the airplane test weighed approximately 200 lb. and the weight of the two pilots and two passengers aggregated about 780 lb.

The Bureau of Mines at present maintains ten railway cars and seven automobile trucks, equipped for mine-rescue purposes, but it often requires considerable time to send these cars or trucks to remote mining camps. It is hoped to demonstrate the value of the airplane in supplementing the work of these mine-rescue cars and trucks, especially in reaching camps where landing fields are available. The speed and mobility of the airplane and its independence of railway schedules and bad roads are also valuable factors in the consideration of its adaptability to mine-rescue purposes.

Langin Field, Moundsville, W. Va.

For the benefit of the airplane pilots who have not stopped at Langin Field, W. Va., lately, and for those who have never been there, the Army Air Service desires to make it known that Langin Field is not the same class of a field that it was approximately one year ago, when the equipment of the field consisted of a ragged Bessonnau hangar, a pair of pliers, an antiquated, improvised radio station of short working range, and a landing field approximately 300 by 1200 ft.

Langin Field is situated one-half mile north of the city of Moundsville, W. Va., and lies between the Ohio River on the west and the tracks of the B. & O. Railroad on the east. The flying field proper is now a rectangle, approximately 600 ft. (E. & W.) by 3000 ft. (N. & S.) and the surface compares favorably with the best of the flying fields of the Air Service of equal size in the eastern part of the United States. Landings may be made from either the north or south ends of the field, depending, of course, upon the direction of the wind. Due to the fact that the field lies directly between hills on both the east and west sides, winds from either of these two directions have very little effect upon either north or south landings. A high tension electric line on 35 ft. poles extends from east to west 800 ft. south of the flying field. This line, however, offers but little hazard to fliers and, furthermore, it is marked with red pennants strung along it and spaced 25 ft. apart.

A steel hangar, 66 ft. by 120 ft., has been erected on the western side of the flying field at the southern extremity of the field, in which are kept the airplane spare parts, one DH4B airplane, an Engineer Corps searchlight truck, and the other transportation belonging to the field. On both sides of the top of the roof of the hangar is painted LANGIN FIELD MOUNDSVILLE in white letters on a red background extending across the entire length of the roof. This lettering is visible on clear days at a height of 8000 ft.

The gasoline filling connection is located on the western side of the flying field just south of the steel hangar and is so located that four Martin Bombers or eight DeHavilands may be "gassed" from the one connection without moving the planes. At the present time all gasoline is pumped into the planes by hand, but electric equipment is being installed, and by this means it is hoped to decrease the amount of time required to "gas up" airplanes stopping at this field. At the present time, with the manually operated gasoline pump, it requires an average time of 8 min. to service a DH plane.

Located directly across the Baltimore & Ohio Railroad tracks from the hangar on the flying field are the headquarters of the field, in a new building erected for this purpose, and the radio and meteorological station. The radio equipment consists of a Navy type 2KW Federal Arc Transmitter and a Navy Type 1420 Receiving Set. The T shaped antenna is supported by two tubular steel masts, each 200 ft. high and located 400 ft. apart. This radio station works directly with Mitchel, Bolling, Langley, Fairfield, Chanute and Selfridge Fields, and handles on an average of 100 messages daily. Small red pennants have been strung on both of the two outer horizontal wires of the antenna, to make it more visible to airplane pilots. Red wind cones are also displayed on either end and the center of the radio antenna. The required electric lights are located on top of both of the masts.

Commercial telephones (Am. Bell System) are installed in headquarters building (Moundsville 568) and in the radio and meteorological station (Moundsville 557) and pilots having forced landings in this vicinity or desiring weather reports may obtain the necessary relief or information by calling either of these two telephones. A Western Union telegraph office is located in Moundsville, ½ mile distant from the flying field.

The regular hours of duty on the flying field are 7.00 a. m. to 6.30 p. m. during the summer months. Whenever airplanes are reported as en route to this station, the mechanics and radio operators remain on duty until the planes have arrived or have been otherwise reported.

The hotel accommodations in Moundsville are fair, but compare favorably with the best, in any like town of 10,000 population. Better accommodations may be obtained in Wheeling, W. Va., located 11 miles north of Moundsville and reached by street car, railroad or taxi.

The present personnel at the field consists of: one officer of the Air Service, one Warrant Officer, three enlisted meteorologists of the Signal Corps, two radio operators and seven mechanics (enlisted) of the Air Service.

June, 1923, was the banner month for the service at Langin Field, 130 airplanes having been serviced. Since the Air Service has taken over the field more than 1000 airplanes have been serviced and only three minor accidents have occurred to airplanes in either landing or taking off.

Lawrence Sperry Aircraft Corp.

The Sperry Company recently completed a Government contract for 20 machines which are to be used at Langley, Selfridge and Kelly fields.

A recent issue of the Brooklyn *Standard Union* gives an account of how Lawrence B. Sperry commutes between his home at Garden City and the Sperry factory at Farmingdale in one of his planes. Mr. Sperry makes the fourteen mile flight in something under ten minutes.

Airships Incorporated Activities

Work has been started on three TC airships on a contract recently awarded by the Air Service.

The TC is the latest large size training ship in use by the Air Service. It has a capacity of 200,600 cu. ft., length overall 195.81 ft. and a maximum diameter of 44.54 ft. The ships carry a crew of six men and have a cruising radius of 1630 miles at 47 mi./hr. and a maximum speed of 60 mi./hr., being powered with 2 Wright Type I engines mounted on out-riggers just forward of midships of the car. It is expected that all three of these ships will be completed and in service within a year.

The VSMB built by Airships, Inc., for the Air Service has been temporarily detailed to the Department of Agriculture to aid in the destruction of the gypsy moth. The airship is especially equipped to war on insect pests. It is the smallest twin-engined airship in the United States, being 108 ft. long and 30 ft. in diameter at the largest section. Power is provided by two 75 hp. Wright radial engines, fitted on outriggers between which is installed a hopper containing 400 lb. of insecticide. A fan operated by the engine blows the poison out and down as the ship moves slowly over the tops of the trees.

The shape of the motor balloon is new, the envelope being especially designed so as to afford easier control with smaller surfaces. The passenger and cargo car is swung in the center and is 16 ft. long, 4 ft. deep and 2¼ ft. wide.

Senator Shoots Down Balloon

Governor W. D. Denney of Delaware and United States Senator L. Heisler Ball of that state, who witnessed the anti-aircraft practice of the 198th Machine Gun Battalion of the Delaware National Guard at Yaphank, L. I., Aug. 16, gave a creditable account of themselves when they were permitted to empty a few pans of machine gun bullets at free balloons.

Four machine guns were ranged side by side, and the Governor, the Senator and two members of the Governor's staff were instructed by regular army men who have been training the unit at Camp Alexander Hamilton not to open fire until the order was given. Senator Ball let go with his gun as soon as the balloons drifted into range and on the second shot brought one down. In his anxiety to hit the target he bent too close to his gun and his clothing was badly stained by powder. The Governor was unable to make any direct hits, although his shooting was "close."

The 198th Battalion carried out several military problems. The first of these was to get into concealment under camouflage and bring down enemy planes drifting across the range. The planes were represented by free balloons. So well did the guards conceal themselves that Governor Denney and his party, trudging through trenches and over obstructions, searched long before they found the hidden positions. When the "enemy" came over, the balloons were quickly demolished. In another problem the anti-aircraft gunners protected a truck convoy from swooping aircraft, and within a few minutes had cleared the air.

Regular army officers here said the work of the battalion was far above the average for State troops. Regulation and tracer bullets were used in the shooting. Later at Lanier's Farm, off Moriches Bay, the Sixty-second Artillery set up its guns so that they faced out on the bay and gave an exhibition of firing at bursts—puffs of smoke from anti-aircraft guns which make black rings against the sky.

Fairchild Aerial Camera Corp.

The Fairchild Aerial Camera Corp. of New York has purchased from the Netherlands Aircraft Co. of that city a Fokker Express two-seater for aerial mapping work. They have also purchased from the Aeromarine Plane & Motor Co., of Keyport, N. J., an Aeromarine seaplane which will be used on a mapping contract which the Fairchild Corporation has under way in Canada.

The first aerial photographs of the City of Erie, Pa., were recently taken by the Fairchild Company. They were pictures of the business sections and large industrial plants for use of the publicity committee of the Erie Chamber of Commerce. Pictures were also taken for the State Park and Harbor Commission.

Chicago Notes

Charles Dickinson, president of the Aero Club of Illinois, made two flying business trips to Pelican Lake near Minneapolis, Minn., during the week of Aug. 5-11 in company with "Buck" Weaver, flying Mr. Dickinson's Breguet.

Eddie Stinson arrived in Chicago last week with 400 lb. of moving picture films of President Harding's funeral train. Friday morning Stinson left in his JL all metal plane for Marion, Ohio, returning to Chicago by 8 o'clock the same night with a load of pictures for a local morning paper.

Two planes circled over the presidential funeral train as it neared Chicago on the afternoon of Aug. 6. They were mail planes ordered out by Postmaster General Harry S. New after a long distance telephone request by the Chicago *Herald-Examiner*. The planes were piloted by E. Hamilton Lee and Tex Marshall.

Purple asters and roses were dropped on the train as it pulled into the Kedzie avenue station where thousands awaited its arrival.

Pilot Roy Guthier, who has been seriously ill with appendicitis is now on the road to recovery and will no doubt be again seen in the air within a short time.

The Heath company's plane "Favorite" is operating at Sandy Beach resort, Dowagiac, Mich., in charge of W. W. Meyer, taking passengers and giving exhibitions for the benefit of the guests.

Severe thunder storms which swept Chicago Friday and Saturday night did not fail to leave their marks on flying equipment stored at the various fields. LaPierre Cavender's Canuck, which had been rebuilt only a few weeks ago, was practically demolished. LaParle brother's Seagull, moored in Belmont harbor, was tossed about and its ailerons damaged.

At the Chicago Air Park field, we learn, a hangar gave way in the storm, probably damaging the planes it sheltered. All fields were under four to six inches of water and flying on Sunday was practically at a stand-still. Telephone communication was cut off in most cases due to wires and telephone posts being down. Much more damage was no doubt done, which has not yet come to our attention.

Keep Control Wires Clear

The jamming of a control wire recently caused the death of Jean Casale, one of the best airplane pilots of France. Casale was piloting a new four-engined B'ériot-Spad transport plane from Paris to the beach of Le Touequet, where the Aero C'ub of France was holding an aerial rally, when at 2000 ft. a'titude the machine suddenly went into a side slip and stayed in this position until it crashed. The pilot was dead when found, but the mechanic who accompanied him was only shaken up. The committee of inquiry appointed by the French air department found that the accident was due to a jamming of the control wires.

In this connection it may be noted that cases are on record where control wires have jammed on airplanes in which bits of equipment, small parts, tools, etc. were left lying in the cockpit prior to taking off. It follows that great caution should be exercised to see that everything that belongs into the cockpit is stowed in its proper place, and that objects that do not belong there are removed before going up.

Buffalo-New York Air Service

The Curtiss Company is now operating an air delivery service between New York and Buffalo. No established schedule is maintained at present, the company furnishing an intermittent service as the occasion requires.

Goodyear News

G. M. Stadelman, president of the Goodyear Tire & Rubber Co., has been elected to the board of directors of the Lincoln Highway Association.

Goodyear officials took an active part in the formation of the Lincoln Highway association, and have been prominent from the beginning in its activities for cross-country highways. The association represents the earliest organized effort to secure improved transcontinental highways and it was the pioneer in encouraging roadbuilding work all over the nation.

The addition of President Stadelman to the board is in recognition of his long interest in the association's work.

Howard E. Coffin, Pres. B.H. Mulvihill, V. Pres.

Official Bulletin of National Aeronautic Association of U.S.A.

B.F. Castle, Treas. John B. Coleman, Rec. Sec.

Col. H.E. Hartney, General Manager Cable Address, Naaero
National Headquarters, 26 Jackson Place, Washington, D.C.

The National Aeronautic Association of U.S.A. assumes responsibility for the statements under this heading

Contestants and Flying Schools Selected

Forty young Americans who want to learn to operate an airplane have been accepted as contestants by the National Aeronautic Association for the free flying scholarships which that Association has offered to award in various cities.

They have equipped themselves with up-to-the-minute aeronautic lore, and they are going to wage a campaign to interest the community in the importance of making America First in the Air.

According to a statement issued by the National Aeronautic Association, they will tell what is being done today in America and Europe in the way of mail, passenger and freight carrying through the air at a speed of 100 mi./hr., and the Association asks all patriotic citizens to give to this campaign five minutes of their time to listen to the story of the progress in this epoch making means of transportation.

The authorized contestants, so far announced, are:

Fort Smith, Ark.—Francis T. Zenor, 1002 N. 12th St.
Norwalk, Conn.—Clinton P. Jessup, 15 Arch St.
New Britain, Conn.—Charles L. Wright, 185 Glenn St.
Wilmington, Del.—John M. Emory, 813 So. Harrison St.
New Orleans, La.—Louis W. Dorhauer, 2118 Josephine St.
Bangor, Me.—N. J. Budway, 689 Main St.
Baltimore, Md.—Ray K. Dawson, 2549 Lauretta Ave.
Brookline, Mass.—Thomas P. Joyce, 1352 Beacon St.
Detroit, Mich.—Albert W. Jernberg, 233 LaPrairie Ave.
Saginaw, Mich.—Russell Gawne, 1101 Carroll St.
Traverse City, Mich.—Geo. F. Schulgen & Dewey A. Hansding.
Kansas City, Mo.—Walter H. Miller, City Hall.
Nevada, Mo.—Ray E. Scott.
Lincoln, Nebr.—Harold W. Zipp, 74 West A St.
West New York, N. J.—J. P. DeSaussure.
Laurel Springs, N. J.—James S. Reynolds.
Brooklyn, N. Y.—Andrew Fornal, 88 Clay St.
Cohoes, N. Y.—W. T. B. Morrissey, 105 Main St.
New York City, N. Y.—Charles Burton Many, 625 West 169th St.
Thomas C. Florich, 2307 Morris Ave.
William Florich, 2307 Morris Ave.
Lloyd E. Smith, 44 W. 98th St.
Buffalo, N. Y.—Harold Earl Chase, 52 Kermet Ave.
Dayton, Ohio—Eugene E. Adams, 35 Dayton Ave.
Miss Ruth McIntosh, 803 So. Perry St.
Miss Rosalena Nilles, 734 Carlisle Ave.
Elmer T. Steger, 545 West 2nd St.
Claude White, 837 Hopeland St.
Tulsa, Okla.—Chas. W. Foley, 1509 S. Elwood St.
Oklahoma City, Okla.—Curtiss Atterbury, 829 W. 8th St.
Pittsburgh, Pa.—Geo. F. Daugherty, 5001 Centre Ave.
Mill Hill, Pa.—Paul M. Armstrong.
Charleston, S. C.—Richard A. Burris, Jr., 499 Meeting St.
Alonzo Burris, 499 Meeting St.
Watertown, Wisc.—Alvin A. Wegeman.

In addition to the foregoing accepted contestants there are a large number of candidates whose papers have not been perfected, covering many cities and nearly all of the states.

Eight American flying schools have already been selected for the Association's free flying courses.

These schools have been picked with reference to the location of the largest number of contestants, and other schools will be added from time to time as the contest develops.

For Maryland and the adjacent states the flying course of the American Aircraft, Inc., of Baltimore has been selected. The American Aircraft course consists of straight commercial flying with sufficient acrobatic and technical ground training to properly qualify the student as a pilot. The school will undertake the training of 20 students at a time.

Another of the free training schools will be at Kokomo, Ind., where the Kokomo Aviation Corp. of Kokomo, Ind., will give a fifteen days instruction, including ten full hours in the air. This school is located four miles south of Kokomo with 100 acres ground space, the pupils having the privilege of spending any part of the time on the ground in assisting in such practical work as rigging, overhaul motor repair, etc.

Two of the schools are located in Illinois. One is that of the Mid-West Airways Corp., at Monmouth, Ill. This school gives ten full hours in the air, and its course covers also careful ground work so that the student will be able not only to fly but take care of his plane and engine. Students are also taken on cross country flights.

The second Illinois school is the Ardie Miller School at Benton, Ill. The course in this school extends over 30 days, and includes mechanical instruction, principles of flight, rigging, etc., and 11 hr. instruction in the air.

The school selected for the Northwest is the Curtiss Northwest Airplane School at Minneapolis, Minn. This school has been training students for five years, giving a thorough course for commercial flying, and turning out many good pilots. Ed. Ballough, formerly instructor in special flying for the Royal Air Force is chief instructor at this school.

In Michigan the flying school known to air pilots as the Burns Flyers School, of Fenton, Mich., presided over by Guy Burns, has been selected. The Burns Flyers course of making air pilots consists of 10 hr. instruction in the air, with ample motor, rigging and repair work to make the graduate capable of handling his ship in the air and on the ground. The airdrome of this school is at Long Lake, near Fenton.

The flying school of the Shank-McMullen Aircraft Co. located four mile east of Huntington, W. Va., is another good school at which winners of the free flying scholarship contest will be trained. Bob Shank, a former crack air mail pilot, and A. B. McMullen, "the flying farmer", head this school. The course of training is the Gosport system, and includes 15 hr. in the air, with 1 hr. solo, and the necessary knowledge of rigging and repair of planes.

For the St. Louis district, the school of the Robertson Aircraft Co. at Anglum, Mo., has been selected. Major Robertson is the chief instructor at this field, and uses the Army "All Thru" system. The course includes the usual instruction in the air with solo work, and also practical ground work in construction and repair.

F.A.I. Adopts Proposals

The International Aeronautic Federation in session at Gothenburg, Sweden, adopted Aug. 13 three proposals made by the National Aeronautic Association as follows:

1. Designation as official stations at which stop watch and chronometer certificates may be obtained, the United States naval observatory at Washington (which had previously been approved) and the chronometer time station at Mare Island, Calif.

2. Speed for straightaway trials shall be computed according to the N.A.A. standard.

3. Provision for the creation of a new category of records for distance flights without a return to the point of departure. Refilling while in transit may be permitted, and the N.A.A. was requested to draft regulations covering this innovation.

Memorial Milestone

Subscriptions to the Memorial Milestone commemorating the work of our aviators at Chateau Thierry, France, have not yet reached half of the required $300.00. If the balance of the subscriptions is not forthcoming within the next four weeks, we shall have to decline the opportunity of erecting this Memorial and return the money already paid in.

U. S. ARMY AND NAVY AIR FORCES

U. S. ARMY AIR SERVICE

Smith and Richter Up 37 hr. 15 min.

Capt. Lowell Smith, A.S., and First Lieut. John Richter, A.S., renewed on Aug 27-28 their attempt to capture the world's duration and distance records now held by Lieuts. Oakley G. Kelly and John A. Macready, A.S., with 36 hr. 5 min. and succeeded in remaining aloft 37 hr. 15 min. 14 4/5 sec. Their performance, made at Rockwell Field, San Diego, has yet to be homologated by the National Aeronautic Association of U.S.A. to become an official world's record accord-

Capt. Lowell Smith (front seat) and Lieut. John Richter, who made a 37 hr. 15 min. duration flight at San Diego, Calif., Aug. 27-28, 1923

ing to the rules of the International Aeronautic Federation. The two fliers also established new marks for speed over approved distances.

As in their previous attempts, the special DH4 plane flown by Captain Smith and Lieut. Richter was refueled in the air from another DH4. On this particular flight the record breaking ship was refueled fifteen times, proving that the feat is entirely feasible given tolerable weather conditions.

The two airmen took off at 5:02:14 a. m. Monday. They landed, as a fog gathered, at 6:19:32 p. m. on Tuesday, the 28th. The summary of their flight, as recorded officially at Rockwell Field, shows the following performances.

World records:

Duration records, 37 hr. 15 min. 14 4/5 sec., or one hour and ten minutes longer than the record of Kelly and Macready made at Wilbur Wright Field, Dayton, Ohio, on April 17 last.

Total distance flown, 5,300 kilometers,or 3,293.26 miles, at an average speed of 88.50 mi./hr. The record of Kelly and Macready was 2,541 miles.

World speed records were broken for 2,500 to 4,000 kilometers.

The following new world speed records were established:

4,500 kilometers, time 31 hr. 36 min. 29 sec., 88.50 mi./hr.

5,000 kilometers, time 35 hr. 4 min. 28 sec. 88.75 mi./hr.

Captain Smith was born in Santa Barbara, Cal., and during the recent war was assistant officer in charge of training at Kelly Field, Tex. Later he was a member of a Handley-Page bombing group in England. In October, 1919, he won the San Francisco-New York and return air race with 54 hr. elapsed flying time.

Lieutenant Richter, a native of Virginia, received his air training in British and French military schools early in the war and was one of the first American fliers sent to the war zone. He served in the Meuse and Argonne offensives as combat pilot with the 22nd and 139th Pursuit Squadrons of the 2nd Pursuit Group.

Free Balloon Creates Sensation

When the crew of a free balloon from Scott Field entered Hoyelton, Ill., a quiet little burg in Washington County, on Tuesday afternoon, July 24 and landed on the outskirts of the town, they found every place of business closed and all the streets deserted. All of the inhabitants had turned out to see the airmen land in their curious conveyance, and business had been suspended while proprietors and clerks went out to see the strange sight.

The balloon, a 35,000 cu. ft. capacity bag, left Scott Field Tuesday morning with two instructors, Capt. E. W. Hill and Lieut. W. J. Flood, and four reserve officers undergoing training — Lieuts. Guy Oatman, A. K. Harris, J. R. Rogers and J. L. Adams.

The balloon ascended at 9:45 a. m. to an altitude of 900 ft., taking a southeasterly direction. After a few minutes in the air, the pilot brought the balloon down to an altitude of 500 ft., which was held for the rest of the flight. A landing, the balloon was brought to the ground at a speed of Hoyelton, Ill., and 60 miles southeast of Scott Field. In order to give the reserve officers the experience of a military landing, the balloon was brought to the ground at a speed of 800 ft. per min., causing the balloon to bounce several times before it settled to the ground. The curious spectators were more than anxious to help pack and make ready the balloon for its return to Scott Field. A truck from Scott Field finally arrived at 1:00 p. m., to bring the balloon and crew back to their station. The truck returned through Bearoupe, Okawville, Nashville and Mascoutah, Ill., arriving at Scott Field the same evening at 7:30 o'clock.

Personnel Notes

Capt. Earl L. Naiden, A.S., has reported for duty at Langley Field to assume the duties of chief instructor in the Air Service Tactical School. He has recently been on duty as instructor in Air Service subjects and tactics at the General Service Schools at Fort Leavenworth, and was a student in the last course, 1922-1923.

A number of Reserve officers completed, on Aug. 11, two weeks of intensive training at Langley Field. Maj. W. Sherman, A.S., in charge of the training of this class of Air Service Reserve officers, prepared a curriculum covering flying both dual and solo on training types of planes and flying on service types of those who were qualified. Included in the course was also a series of daily lectures on the tactical employment of aviation and practical work in the aero repair and machine shop.

Lt. Col. Charles H. Danforth, A.S., commanding officer at Langley Field, was recent host to the Hampton Rotary Club at a luncheon served at the Officers' Club, Langley Field.

Changes in Stations

The Adjutant General's Office announces the following changes in station:

16th Obs. Sq. from Richards Field, Mo., to Marshall Field, Kans.

9th Photo Sec. from Richards Field, Mo., to Marshall Field, Kans.

Army Orders

Resignation of First Lieut. William Henry Carthy, A. S., accepted.

Sec. Lieut. Dudley W. Watkins, A.S., from Brooks Field to Honolulu.

Assignment of First Lieut. Carl W. Pyle, A. S., McCook Field, to Honolulu, revoked.

Sec. Lieut. James Turner Nolen, jr., A.S.O.R.C., from Middleton, Tenn. to A. S. Primary Flying School, Brooks Field, for instruction.

Sec. Lieut. Gunnard Alvin Dalhberg, A.S.O.R.C., Brooks Field, to A.S. Primary Flying School, that station, for instruction.

Leave of absence to First Lieut. John H. Gardner, A.S., extended seven days.

Maj. John D. Reardan, A.S., appointed to Ward Department Board of Contracts and Adjustments, vice First Lieut. Williams V. Andrews, A. S., relieved.

Capt. Ralph P. Cousins, A.S., from Office C. A. S. to Chanute Field, Rantoul, Ill.

Leave of absence for one month and fifteen days to First Lieut. Edward L. Fernsten, A. S.

Sec. Lieut. Thomas R. Howard, A. S., Brooks Field, to regular flight duty.

First Lieut. Theodore J. Koenig, A. S., from Office C.A.S. to Organized Reserves Ninth Corps Area, Sand Point, Wash., effective Oct. 15.

Sec. Lieut. Harvey K. Greenlaw, Cav., to A.S., Brooks Field, for training in A.S. Primary Flying School, that station.

Sec. Lieut. Claude E. Haswell, Inf., from 17th Infantry, Fort Omaha,, Neb. to Air Service, Brooks Field, for training in A.S. Primary Flying School

Sec. Lieut. George Lowry Vickery, A.S.O.R.C., from Memphis, Tenn. to A.S. Primary Flying School, Brooks Field, for instruction.

U. S. NAVAL AVIATION

Test Flights of N2N Training Plane

The N2N, a naval training plane, was tested recently at the Naval Aircraft Factory at Navy Yard, Philadelphia. It is one of a number of planes that the Navy is trying out toward developing a type combining the various functions of naval aircraft training of student aviators. The N2N is a biplane with a threefold utility. It may be used for primary seaplane training, when fitted with pontoons for water landing. It may be used for landplane training when equipped with landplane gear, and it may also be used for gunnery instruction, being adapted for work with machine guns, with both fixed and free mountings.

On completion of all tests at the Naval Aircraft Factory, where it was built, the N2N will be sent to the Naval Air Station at Pensacola, Fla., to be tested under service conditions.

Pacific Air Squadrons

Naval aircraft from the Aircraft Squadrons Battle Fleet will participate in the celebration of the American Legion Convention to be held at San Francisco from Oct. 15 to 19. Capt. A. W. Marshall, U.S.N., Commander, Aircraft Squadrons Battle Fleet will arrange for the participation of the Navy planes

More Catapults for Fighting Ships

The work of fitting the battleships and scout cruisers with planes and catapults is progressing very satisfactorily. Four more Mark I catapults are being constructed. It is the purpose of the Bureau of Aeronautics to have all the battleships, scout cruisers and fleet submarines eventually fitted with planes.

Orders to Officers

Lieut. Tyler W. Spear, detached U.S.S. Wright, to course of instruction, Naval Medical School, Washington, D. C.

Lieut. Cyril K. Wildman, detached Torpedo Plane Squadron One, Aircraft Squadrons Battle Fleet, 9-25-23, resignation accepted 9-25-23.

Lieut. Albert S. Freedman, (SC) detached Naval Air Station to disbursing officer, Aircraft Squadrons Battle Fleet.

Lieut. Gerald Selby (MC) detached Naval Air Station, Hampton Roads, to course of instruction Naval Medical School, Washington, D. C.

Lieut. Joseph B. Logue, (MC) detached Recruiting Barracks, Hampton Roads to Naval Air Station, Hampton Roads.

Ens. Philip A. Haas, detached Aircraft Squadrons, Battle Fleet to Navy Yard, Puget Sound, Washington.

Ch. Bosn. George R. Groh, detached Aircraft Squadrons Battle Fleet to Naval Air Station, San Diego.

Pay Clk. Water A. Hill, detached Naval Aircraft Factory, to Naval Experimental and Research Laboratory, Bellevue, D. C.

Pay Clk. William A. Swanson, detached U.S.S. Oklahoma, to Naval Air Station, Pearl Harbor.

Gunnery Performance Credited to Aircraft Spotting

The fact that aircraft spotting of battleship gun fire is recognized as of highest value is shown in the following quotation from a report from the Commander, Aircraft Squadrons Scouting Fleet.

"The news that the Wyoming stood first in gunnery for the year 1922-23 was received by the Aircraft Squadrons with enthusiasm. It calls to mind the part the Aircraft Squadrons played in this excellent performance. The strenuous work at Panama, followed by a rapid shifting of engines at Colon enabled the planes to start north in time to spot at Guantanamo if the 2000 miles could be made without a single delay throughout the whole trip. The last day's flight had to be made 500 miles (from Cienfuegos to Guantanamo) in the teeth of the trade winds. No aircraft tender could be made available at Guantanamo. The planes of the spotting and photographic divisions reached Guantanamo just before dark, broke into a storehouse, routed out some drums of aviation gasoline, gassed until eleven o'clock at night, and at six the next morning were on station to spot for the battleships. Last but not least, the spotters in the air got every single spot through and the photographers never missed a salvo. The scores of the Wyoming tell the story of the accuracy of the spotting, and the letter of commendation from the Scouting Fleet photographic officer vouches for the value of the aircraft photographs."

Navy Wright Pulitzer Race Entry Tested

The Navy Wright Racer, TX, one of the entries in the Pulitzer race, was flight tested for the first time at Curtiss Field, Garden City, L. I., on Aug. 27. The test was generally satisfactory. The Navy Wright is a biplane powered with the new 700 hp. Wright T3 engine and is equipped with wing radiators. First Lieut. L. H. Sanderson, U.S.M.C., piloted the plane in the test flight.

COMING AERONAUTICAL EVENTS

DOMESTIC

Oct. 1-3 — National Airplane Races, St. Louis, Mo.
Late Fall — Curtiss Marine Flying Trophy Race

FOREIGN

Sept. 23 — Gordon Bennett Balloon Race, Brussels, Belgium
Sept. 28 — Schneider Maritime Aviation Trophy Race, Cowes, Isle of Wight, England
Oct. 14 — Beaumont Cup Race, Istres, France
Dec. 1 — Entries close for French Engine competition

Capt. Henry C. Mustin Dies

One of the pioneers of American Aviation passed away on Aug. 30 at the Naval Hospital at Newport after a long sickness. His record in the Navy was one of brilliant initiative and he may quite properly be remembered as the "father of Naval Aviation."

Rear Admiral Moffett, Chief of the Bureau of Aeronautics, Navy Department, issued the following statement on the death of Capt. Henry C. Mustin, U.S.N.:

In the death of Captain Mustin the science of aviation has lost one of its most devoted exponents and the Navy a capable and hard working officer.

Captain Mustin can well be referred to as the father of

Capt. Henry C. Mustin, whose death has resulted in great loss to Naval aviation

Naval Aviation. From the time of its inception to the day of his death, he devoted his entire energy, health and life to furthering the development of Naval Aviation, especially as an arm of the Fleet.

He was extremely courageous and a good flier. He flew his own plane the entire distance from San Diego to Panama and return, in command of a squadron of scouting planes.

Captain Mustin was a promoter of the present Bureau of Aeronautics, and its first Assistant Chief. As such he had had a large share in shaping the air policy of the Navy for the past two years. He was a designer of aircraft as well as a student of tactics. He was the author of the catapult idea of launching aircraft from ships, and was the first officer to be "shot" from a catapult in an airplane.

He was the first Commander of the Aircraft Squadrons of the Battle Fleet, and, as such, perfected the system now used in spotting gunfire for the battleships from planes. He was relentless and untiring in his efforts to place aviation with the Fleet. Together with Admiral Bradley Fiske, he developed and perfected the first telescopic gun sight. This type of sight is now used on naval guns throughout the world.

Captain Mustin was a popular and efficient skipper, admired, respected and truly loved by all who served under him. His loss will be keenly felt throughout the entire Naval Service, and especially by Naval Aviation. His death is a great loss to the Bureau of Aeronautics, but the good effects of his work will be felt as long as aviation is part of the Navy.

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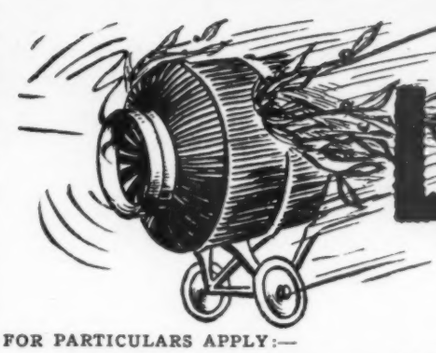

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